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# USSR Report

ENERGY

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USSR REPORT  
ENERGY

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OIL AND GAS

ENGINEER ON REDUCING FUEL OIL CONSUMPTION

Moscow ENERGETIK in Russian No 9, Sep 85 pp 16-17

[Article by V. I. Dultsev, Uraltekenergo [Urals Power Engineering Equipment Association]: "Reducing Heat Consumption in Preparing Fuel Oil for Burning"]

[Text] Fuel oil is delivered to TES's [thermal electric power station] in tank cars which must be quickly unloaded and cleaned. The procedure presently in use calls for the fuel oil to first be warmed inside the tank car, and then in the charging troughs and tanks, the fuel oil storage tanks and in shell-and-tube preheaters prior to being fed into the boiler nozzles.

In accordance with established tradition, it is an accepted fact that the heating of the fuel oil in the tank cars and the cars' cleaning is done with naked steam. In the process, all the condensate is lost, the fuel becomes diluted with water and the personnel are forced to work in hazardous conditions as they install and remove the steam-feed boom (hoses) at an elevation of over four meters and move along narrow and slippery (because of spilled fuel oil) catwalks and tank cars. In winter, the ice which coats everything makes the job even more dangerous.

In the drain troughs, receiving tanks and near the storage tank inlet pipe the fuel oil is heated by steam registers which quickly become damaged and consequently operate in a defective state caused by water hammer, sharp temperature drops along the pipe runs, the absence of expansion compensators and the need to repair them because of high explosion danger.

One hundred percent of the condensate is lost during these stages of the operation. Annual outlays to make up for the losses are from R30,000 to R150,000 (depending on the TES' capacity), and the fuel oil becomes 10 percent diluted with water, reducing the boilers' efficiency by approximately one percent.

During the warm season, the fuel is diluted as well by storm and snow melt water getting into the charging tanks from around the drain racks.

In addition to condensate losses and fuel dilution, an existing procedure which is already in the planning stage involves unwarranted operational heat losses:

- in the cold season when heating the "goose-necks", through which the steam is piped into the tank cars to keep them from freezing;
- in the fuel oil storage tanks, when fuel oil is stored in them;
- in the drain and charging tank preheaters, when no fuel oil is flowing into them;
- in the main fuel oil pipelines.

In terms of money, these losses come to R500,000 per year at individual power stations.

In order to completely eliminate condensate losses and fuel oil dilution, to reduce losses of heat and capital, operational and repair monies, Uraltek-energo has developed and carried out, for individual elements, and in production conditions, a number of measures at several thermal electric power stations without having had to install any additional equipment. It might be well to mention that the results obtained were all positive.

These measures include:

- the use of hot fuel oil to heat the fuel oil in the tank cars, and to clean the cars;
- pumping the flood and storm waters out of the charging and draining unit into a tank installed near the fuel oil receiving tank;
- storing fuel oil in tanks without heating it;

feeding the fuel oil, at a temperature of 50° C into a boiler, and heating it to 120° C in preheaters installed by each boiler. The following needs to be taken into consideration for these measures to be successfully implemented.

Hot fuel oil should be fed into the tank cars at a temperature of no less than 120° C and at a pressure of 0.4 MPa through the drain nozzles with the help of special equipment. The hot fuel oil which flows through the fuel drain valve quickly heats the congealed fuel oil around it (most often it has frozen), and makes it easy for the valve to open. The termination and quality of the cleaning of the tank cars' interior space should be monitored according to the temperature of the tank car wall in the area of the wheelset. It has been established that a wall temperature of about 40° here insures that the tank car will be completely cleaned of fuel oil residues.

The use of hot fuel oil for heating purposes keeps the fuel oil from being diluted with water as the tank cars are being drained and cleaned. It also

eliminates the need to heat the fuel oil in the drain chutes and the receiving tanks, thus ruling out the need to install steam registers and the need to feed in more heated fuel oil.

The feeding of hot fuel oil into a tank car from the bottom through a drain pipe provides the initial heating of the lower layers of fuel oil as well as their draining, which precludes the possibility of the tank cars being filled to overflowing; a higher quality of cleaning, done with the tank car fill neck closed (by virtue of ruling out heat losses caused by ventilation of the tank car with cold air); and improves the working conditions of the maintenance personnel.

This method of tank car processing was initially tried out in production conditions at the Solikamskaya TETs [Heat and Electric Power Station] and the Nevinomysskaya GRES [State Regional Electric Power Station]. The results of this check demonstrated its advantage over the method for processing railroad tank cars with open steam, which method was in use at TES's. This was later confirmed by comparison tests carried out at the Sredneuralskaya GRES.

This progressive procedure has now been made part of plans for the fuel-oil facilities at the Mosenergo TETs-20, the Surgutskaya GRES-2 and the Cherkasskaya TETs.

The water which goes into the receiving tank during thaw periods and in the precipitation of residues should be pumped into a special tank, which should be installed near the fuel oil receiving tank. The pumps used to pump this water ought to be installed for the purpose of pumping over the fuel oil from the receiving and draining unit into the fuel oil storage tanks.

After the sediment is drained, the fuel oil should be drained from the tank by gravity back into the receiving tank and the water should be discharged into waste water disposal and purification facilities. Where there are no such facilities the water should be fed at a metered rate (20-30 liters/hour) into the circuit which conveys the fuel to the boilers when they are operating on fuel oil.

The tank capacity is chosen based on the maximum possible volume for one-time precipitation of residues on the area from which the runoff into the receiving tank has been arranged.

The advisability of taking this measure was checked at the Solikamskaya TETs. One of the fuel oil storage tanks was used for this purpose. The pumping into the tank of flood and storm water and the fuel-oil-infused condensate, which comes into the receiving tank when the tank cars are steamed brought about a marked reduction in the dilution of the fuel oil with water. The best size for the tank was determined during the testing process, and a method settling and draining the waters and fuel oil was developed.

The tests carried out at the Balakovskaya TETs and the GAZ [Gorkiy Motor Vehicle Plant] TETs showed that the fuel in the fuel oil storage tanks, regardless of their volume or the materials of which they are constructed, can be stored,

not in the liquid condition provided for by the plans, (which was made possible with a special heat supply), but congealed down to the ambient temperature. This makes it possible not only to eliminate heat losses, but also to prevent fuel leaks from ferroconcrete tanks. The congealed fuel oil is pumped out with no difficulty by ejecting it along with a jet of hot fuel pumped through a nozzle in the tank's inlet pipe. Preliminary heating of all the fuel oil in the tank is not required.

The conveying of the fuel oil at a temperature of 120°, as provided for by the design specifications, along the fuel oil conduit, which is heated by steam and standard insulation, leads to heat losses averaging  $7 \cdot 10^{-3}$  hectocalories/(t per hour per kilometer). For TES's with fuel oil consumption rates of 300 t/hour and main fuel oil conduits of about three miles' length (for example the Sredneuralskaya GRES), these losses amount to 55,000 hectocalories, or R220,000 per year.

The reduction down to 50° C of the temperature of the fuel oil pumped over from the fuel oil facility, and heating it up to 120° C right before it reaches the boiler reduces heat losses more than 2-fold. Moreover, installing the preheaters inside the boiler room permits them to be completely switched off when the boiler is shut down with no worries that the steam condensers will defrost. This layout was tried with success at the Permskaya TETs-14.

The method of electrically preheating the fuel oil has great advantages. It should be remembered that only 30 percent of the heat from the steam which is fed to the fuel oil facility is used advantageously, and 70 percent is lost when the efficiency factor of the electric preheater exceeds 90 percent. It permits the heating process to be fully automated, which is totally impossible where steam is used as the heat source. Electric preheating is particularly effective at TES's which operate on gas, but which have fuel oil facilities which operate constantly to provide an instantaneous changeover to liquid fuel use when the gas supply is shut down. The petrochemical industry presently makes widespread use of electric preheaters.

The comprehensive introduction of the proposals made by Uraltekhenergo in the procedures for receiving and preparing fuel oil for use, and for feeding it to the boilers is reducing the time needed to unload the tank cars, is improving the quality of their cleaning out, is totally eliminating the dilution of the fuel and the condensate losses, is reducing heat losses and is reducing environmental pollution. This will make possible, depending on the capacity of the receiving and draining equipment, the obtaining of an economic effect of from R100,000 to R600,000 per year at each power station.

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OIL AND GAS

PRODUCTION, REPAIR PROBLEMS AT MUBARAK GAS REFINERY

[Editorial Report] Tashkent SOVET OZBEKISTONI in Uzbek on 14 August 1985 carries on page 4 a 900-word article by M. Karomov entitled "Cohesiveness Needed" in which he discusses the need for repair work at the Mubarak Gas Refinery in Kashkadarya Oblast. The refinery supplies gas to large cities of the country and to Central Asian republics. Its mission is to supply 16 billion cubic meters gas annually, as well as the raw material sulphur to a variety of enterprises. However, in recent years the plant has fallen into a backward status. Its failure to fulfill its 1984 and 1985 plans means a shortfall in production of 1.5 billion cubic meters gas. There are objective causes for this situation. The plan quotas for sale of gas have risen with the commissioning of new capabilities, but construction of other projects, including the fourth stage of the refinery and the thermal energy center, hasn't kept pace. The refinery's administration has permitted such shortcomings as work stoppages due to disorder in the shops, equipment shutdowns, disfunction of sewage and sanitation facilities, and shortage of specialists. Soyuzuzbekgazprom has outlined a series of measures to effect needed repairs at the refinery. However, the plant can't reach full capabilities by winter without additional workers. Consequently, the Soyuzuzbekgazprom has set up a special center for coordinating repair work and hiring more workers.

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OIL AND GAS

SULPHUR EXTRACTION UNIT PLANNED FOR SHURTAN GAS MINE

[Editorial Report] Tashkent SOVET OZBEKISTONI in Uzbek on 16 August 1985 carries on page 1 a 200-word item from UzTAG entitled "Shurtan Gas for the Country" which reports that a new unit for the extraction of sulphur from natural gas has been commissioned at the Shurtan Gas Mine in the Karshi Steppe. It will have the capability of producing 4 billion cubic meters fuel annually. In the next 5-year plan reclamation of this region's natural resources will continue. Besides increasing gas production plans call for expanding the enterprise's capabilities for producing diesel fuel condensate and various other gas-based chemical products.

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COAL

STATUS OF COAL-MINING MACHINERY EQUIPPING PROGRAM REVIEWED

Moscow EKONOMICHESKAYA GAZETA in Russian No 34, Aug 85 p 2

[Article: "Progressive Technologies for Mining Coal"]

[Text] The USSR's Energy Program, among its most important measures for providing the national economy with energy resources and for improving the structure of the energy balance, calls for a considerable increase in coal mining. The solution of this task involves the rebuilding and reequipping of existing underground and strip mines, the construction of new coal-mining enterprises on the basis of advanced equipment and technology, and more complete use of existing capacity.

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One of the main areas for scientific and technical progress in the industry and for an increase in the mining of coal is the outstripping development of the open-pit method for excavating coal fields.

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The prime operating costs for mining coal by the stripping method is one-fourth to one-fifth that of the underground method. Labor productivity at strip mines is 5-fold to 6-fold that of underground mines.

This year the share of coal mined by the open pit method will be 42 percent of the total amount mined versus 37.8 percent in 1980. The Energy Program specifies that this be brought up to 56-60 percent by the year 2000.

We have created high-capacity fuel-and-power engineering complexes--Ekibastuz, Kansk-Achinsk and Yuzhno-Yakutsk--and the Kuznetsk coal basin and the fields of Siberia and the Far East will be further developed. The largest mines are the Bogatyr Strip Mine at Ekibastuz (50 million tons per year), the Borodinsky Strip Mine in Krasnoyarskiy Kray (25 million tons), the Azeyskiy Strip Mine in Irkutsk Oblast (15 million tons) and the Neryungrinskiy Strip Mine in Yakutiya (11 million tons). Labor productivity here is 1,000-1,400 tons per worker per month, which is 2-fold to 3-fold the average at the industry's other open-pit excavations.

These results are being achieved through the wide use of the nontransporting and the transport-and-heaping systems of excavating fields and use of flow-line and cyclic flow-line technology for stripping work, the creation and introduction into production work of new and progressive types of high unit

capacity mine-transport equipment that was created at enterprises of Min-tyazhmash [Ministry of Heavy and Transport Machine Building] and other machinebuilding ministries, and the acceleration of the comprehensive mechanization and automation of coal-mining operating processes. There are many examples of progressive technology introduced into coal mining within a short time.

Powerful ESh-100.100 and ESh-40.85 walking draglines are operating at the Azeyskiy, Krasnogorskiy and Nazarovskiy strip mines, as are new northern-version drill rigs of the SBSH-250-55 roller-bit type at the Neryungrinskiy Strip Mine. Automotive coal carriers and dump trucks with 120 and 180 tons of load capacity and 8-axle self-dumping cars with 145 tons of load capacity are undergoing field testing.

The machinebuilders have shipped the first models of the ESh-40.85S walking dragline in the northern version, the ERP-5250 rotary excavator with increased cutting force, the PEET-type DC traction units, the EKG-10 and EKG-15KhL quarry excavators and the ZSBSh-200-60 drill rigs, which are badly needed for stripping work where climate and mine-geology conditions are complicated.

This year the first phase of the Vostochnyy Strip Mine at Ekibastuz is being put into operation with 15 million tons of annual capacity. The coal will be transported from the mine face here by means of high-powered conveyors. So-called blending complexes for controlling the quality of the coal dispatched are called for.

In the Kansk-Achinsk basin, continuous-action machine complexes of 5,250-cubic meters per hour capacity are being erected at the 55-million ton capacity Berezovskiy Strip Mine No 1, which is under construction. Using them will enable both stripping work and mining operations to be performed for the first time in our country by progressive flowline technology.

Unfortunately, the strip coal mines' requirements for mining and transporting equipment of high unit capacity still is not being completely satisfied. Thus refinement of the EKG-20 quarrying excavator with 20-cubic meter bucket capacity, which was intended for operating at low temperatures at the Neryungrinskiy Strip Mine in the Yuzhno-Yakutsk basin, has been delayed for a long time. A test model of this machine was manufactured by Uralmash, jointly with Minelektrrotekhprom [Ministry of Electrical-Equipment Industry] back in 1978. However, because of constructional and operational deficiencies and low quality of the manufacture of various components of the mechanical and electrical portions, series production is not planned for it until 1986. Minavtoprom [Ministry of Automotive Industry] is lagging in arranging for the serial output of dump trucks with load capacities of 180 tons or more.

The creation and production of crawling quarry excavators of 20-cubic meter or more of bucket capacity, draglines with 100-cubic meter capacity and boom length of 125 meters, rotary excavators, heap formers, reloaders and belt conveyors for mining and stripping operations with productivity of 5,000-12,500 cubic meters per hour, highly productive (up to 2,500-3,000 cubic meters per hour) sifting and crushing machines, and other progressive equipment--the bases for introducing effective technology--should be speeded up.

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The output of new equipment for mining coal underground under complicated mine geology conditions is being expanded.

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In order to excavate coal from thin (down to 1.2 meters) seams, mechanized KM-103 and KD-80 longwall-type mining machines, which will enable cutting into wall rock to be avoided, are being introduced. In this way the coal's ash content is greatly reduced and the effectiveness of mining it increased. Thus, at the underground mines imeni Ye. T. Abakumov and Zarya in Donetsk Oblast, an average daily workload of 1,000 tons of coal or more was achieved at mine faces equipped with KM-103 longwall mining machines.

Series output of the ANShch unit and KGU supports for steep seams has been arranged. At gently sloping seams of average thickness or at thick seams with roofs that are difficult to cave, the KM-130, KMT, UKP and OKP-70 breakage-face longwall mining machines have proved themselves well.

In 1985 longwall mining machines of the new technical generation make up more than 60 percent of all deliveries. The supplying of highly productive equipment to underground mines has enabled the level of integrated mechanization at breakage faces to be raised from 67.4 percent in 1980 to 72.2 percent in 1984 and the equipping program to be basically completed in the Karaganda, Pechora and Moscow basins and also in a number of Donbass [Donets Coal Basin] and Kuzbass [Kuznetsk Coal Basin] production associations.

In their technical level the Raspadskaya mine in the Kuzbass, the Mine imeni A. G. Stakhanov in the Donbass, the Vorgashorskaya mine in Vorkuta, and the Mine imeni Kostenko in Karaganda cede nothing to and in some respects surpass leading foreign coal-mining enterprises.

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Preparation of the scientific and technical programs for the 12th Five-Year Plan, which call for reequipping the underground mine inventory and for comprehensive mechanization is being completed in the coal industry.

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More than half of the underground mines have not been rebuilt in a long time. Labor productivity at them is 1.5-fold to 2-fold below that at rebuilt and newly built mines.

A radical rise in the technical level of the underground mining of coking coal and also of the more valuable grades of steam coal in the Donets, Kuznetsk, Karaganda, Pechora and other basins requires, along with acceleration of underground-mine rebuilding, most rapid solution of the problem of the comprehensive mechanization and automation of production processes. This is all the more important inasmuch as mine-geology conditions here for mining worsen each year because of the increase in excavating depth of the coal seams.

It is planned to raise considerably by 1990 the level of integrated mechanization at breakage faces. The production of longwall-type mining machines for thin seams (the KM-103 and KD-80), for gently sloping seams of average thickness and for thick seams (the UKP and OKP-70), for seams with roofs

difficult to cave (the KMT), and for mines with steep dip (ANSchch), as well as complexes on a new technical level which are now being created, should provide for full replacement of the equipment that is now excavating coal.

The labor intensiveness of breakage work at faces with the new longwall-type mining machines will be reduced 1.5-fold to 2-fold. In so doing, the level of use of manual and, especially, of heavy physical labor is being reduced 1.6-fold to 2.3-fold.

The hydraulic method of coal mining deserves much more attention.

Labor productivity at underground hydraulic mines is 1.3-fold higher than at ordinary mines that have similar conditions. In the Kuznetsk, Karaganda and Donets basins, it is planned to build hydraulic complexes for excavating seams under the most complicated mine-geology conditions, where the use of traditional equipment for integrated mechanization is ineffective.

The equipment and technology for hydraulic mining will be improved during the 12th Five-Year Plan on the basis of new systems and also the introduction of hydraulic monitors and mechanical-hydraulic cutter-loaders of increased unit capacity that have remote and programed control. Mintyazhmash plants should extend great assistance to the mines in this regard.

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The use of progressive equipment and technology in underground mine excavating will enable the tunnelers' labor productivity to be increased by 25 percent.

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During the 12th Five-Year Plan the level of conduct of mine excavation by cutter-loaders and by conveyorization of underground mine transport will increase. Obsolete models of belt conveyors should be replaced by new conveyors with productivity increased 1.3-fold to 1.5-fold. Heavy electric locomotives of a new parametric series, sectional trains and bottom-unloading mine cars will appear.

Accelerated technical progress will require USSR Minugleprom [Ministry of Coal Industry] to boost development of mine-machinebuilding capacity. Important revisions should be made in investment policy during the 12th Five-Year Plan in accordance with the CPSU Central Committee and USSR Council of Ministers decree on priority development of the machinebuilding complex and creation of the conditions necessary for rapid conversion to the production of mining equipment capable of raising considerably the industry's labor productivity.

So far, plants of the VPO's [All-Union production associations] Soyuzuglemash (the chief is A. Chichkan) and Soyuzugleavtomatika (the chief is V. Kot) have not been coping completely with the assigned tasks of providing the industry with modern equipment. Many kinds of equipment have not been mastered after a long time, or they are being produced in inadequate amounts. In particular, delay in the production of the AK-3 longwall-type mining machine for excavating coal from steep seams, of heavy-type tunneling cutter-loaders, and of drilling and transporting machinery testify to this.

For a number of indicators, the technical level of coal-mine machinebuilding plants lags behind modern requirements, and this is telling on the quality and reliability of the underground coal-mining equipment being produced. Powder-metallurgy, hot gas flame spraying and a number of other progressive technologies still are not finding application. The machine-tool pool needs updating.

The network of scientific-research and design-development organizations, whose composition includes several thousand specialists, is widely developed in the coal industry. The Moscow Basin Scientific-Research and Design-Development Institute, the Donetsk Coal-Industry Scientific-Research Institute, and Gidrougolemash [State Design Development and Experimental Institute for Coal Machinebuilding] and others are making a considerable contribution to the industry's technical progress.

At the same time, the industry's scientific potential (First Deputy Minister M. Shchadov) is not used fully by far. Such important problems as the integrated mechanization of tunneling operations, the creation of equipment and technology for mining coal without the constant presence of people at the mine face, and the working of steep-dip seams under complicated mine-geology conditions are still being resolved slowly.

The coal industry as a whole did not cope recently with plan tasks, and it has been lagging behind five-year plan goals. The new equipment and technology that will come to the miners' aid during the 12th Five-Year Plan period has been called upon to overcome this negative trend and to bring the industry to the marks set by the country's Energy Program.

11409  
CSO: 1822/351

COAL

FUTURE GROWTH OF KUZBASS PRODUCTION, INFRASTRUCTURE QUESTIONED

Moscow SOVETSKAYA ROSSIYA in Russian 18 Sep 85 p 2

[Article by V. Denisov and V. Dolmatov, special to SOVETSKAYA ROSSIYA, reporting from Kemerovo and Moscow: "Kuzbass Coal: Problems in the Industry--Where Should the Miner Dig for an Apartment?"]

[Text] Surrounded by evergreen taiga woods, Mezhdurechensk was founded three decades ago at the confluence at the mountain rivers Tom and Usa. The town grew rapidly, like a giant in the fairy tale, and has now produced more coal than any other mining center in the Kuzbass, with an annual production of almost 30 million tons of fuel. And that is not the limit, because the fuel reserves here, including coking coal, are almost infinite.

"This is a theoretical estimate," notes the first secretary of the town committee of the Community Party, S. Proskurin. "In practice, there is an obstacle to further increases in output. The primary cause is a shortage of labor. Every single mine and stripping is acutely shorthanded. The situation is also difficult for the other industries. For example, half of the cars at Tom-Usa Motor Enterprises, which serves the miners, operate just one or two shifts: there are 150 openings for drivers."

The cause of the labor shortage is no secret: there are long waiting lists for housing, few spaces in preschools and day care centers, and a generally poor level of community services in this young town. The population of Mezhdurechensk has already reached more than 100,000, but the town still has no standard hospital facilities, and the medical facilities are housed in makeshift structures. In apartments, water outages are frequent.

In Novokuznetsk we interviewed the general director of Yuzhkuzbassugol Association [South Kuxbass Coal Production Enterprises]. The director, who had just finished seeing visitors on personal matters, sighed: "I've just seen fifty employees. One is asking for assistance with buying a car, another is involved in a labor conflict. All the rest want apartments."

In the other mining towns the picture is similar. The accelerated growth of coal production in Kuzbass for many years was not accompanied by an equally speedy development of social and public services. The Ministry of the Coal Industry of the USSR has been primarily concerned with

introducing new production capacity. For example, we recall the enthusiasm of the miners at the Nagornaya Mine, who built the new Kusheyakovka production sector by their own efforts amid the woods on a previously undeveloped deposit. The minister was generous with his praise, and the miners certainly deserved it. Now the coal is being brought to the day surface, and the festive toasts have become a memory. But Kusheyakovka is still an empty place: there is no housing, no community services, no good roads. Other mine enterprises are working the Yerunak deposit. Plans call for these areas to become independent production enterprises around a new town, Uskat, but today its neighborhoods remain a dream: not a single housing construction site has been staked out.

Here are the sad statistics: the proportion of spending on nonproductive construction in Kuzbass during the past three five-year periods did not exceed 19-22 percent of the total capital investment. Unfortunately, these miscalculations remained hidden for a long time behind the mountains of coal mined in excess of planned targets. But in 1978, after reaching a record output of almost 115 million tons, the miners of Kuzbass began to lower their output, failing to meet even the reduced plan targets. Typically, this drop came as a complete surprise to the industry's headquarters and planning agencies. Some experts and scientists had been sounding the alarm long before then, but their voices were lost in the din of the resounding production reports.

The gap between the production and social infrastructures portends future disaster. The department of economic forecasts at the Institute of Economics and Organization of Industrial Management of the Siberian Branch of the USSR Academy of Sciences has calculated that if housing construction and development of community services continue at the current rate, Kuzbass will be unable to raise its output above the current level for many years to come. There will be no growth at all!

Certainly, this situation cannot be tolerated. We were told at the Provincial Party Committee meeting in Kemerovo that 34 percent of total capital investment in Kuzbass has been earmarked in the long-term plans for nonindustrial construction. This is encouraging, if one can be certain that the funds will indeed be put to work. Housing construction and the building of community services in the region are the responsibility of the construction departments of two ministries: the Ministry of Heavy Construction (the regional administration, Glavkuzbasstroy) and the Ministry of the Coal Industry itself (Kuzbasszhilstroy construction agency). The performance levels of the two agencies differ, especially as regards productivity: Glavkuzbasstroy is much more efficient, although, incidentally, still not up to current requirements. As to Kuzbasszhilstroy, its annual construction output is hardly increasing at all. Moreover, this fact is not appreciated correctly by the Ministry of the Coal Industry of the USSR. For example, responding to our article entitled "The Hard Seams" (SOVETSKAYA ROSSIYA, 5-6 Jan 1985), the first deputy minister, M. Shadov, contended that, in 10 years, the construction agencies of the industry had succeeded in increasing the volume of work in Kuzbass by 15 percent: marking time is called progress!

After all, the builders of the Ministry of the Coal Industry are constructing housing for their own miners. Will the Kuzbasszhilstroy construction enterprises, with their poor capacity, be able to put into effect the large allocations assigned to it for the Twelfth Five-Year Plan? The answer is obvious. Last year, the volume of housing construction in Kuzbass was set for the immediate future. That important decision is now jeopardized. The builders of the Ministry of the Coal Industry are already behind the plan targets.

One can ask: Does it make sense for the same ministry to be the client and contractor at the same time? The question is not rhetorical. Some time in the past, all construction operators in Kuzbass were concentrated in the same hands--the Ministry of Heavy Construction. It seems that when some of the construction enterprises were transferred to the purview of the Ministry of the Coal Industry (at its insistence) and brought together in a joint concern--(Kuzbasszhilstroy)--the development plans were halted. Separated from the overall construction process, this agency is, as it were, stewing in its own juices and has not been strengthening its production base properly and has not created links with engineering science. The level of industrial methods at the construction sites of the agency is low, a large number of operations are executed manually, and few modern materials and designs are employed. Amazingly enough, the operators of Kuzbasszhilstroy have several factories for the production of modular housing units, and each...has its own production process.

This cottage-industry approach cannot be allowed any longer. Kuzbass is a graphic example of the need for change in the management of construction. The principle is clear: efforts should not be fragmented but rather joined together, which would make it possible to achieve scientific and technological progress in this important industry.

The strategy for the development of Kuzbass will probably determine different tactical approaches in the next few years. It should be borne in mind that this is Siberia, where labor shortages are generally more acute than in other regions. Experts at the All-Union Scientific Research Institute of Complex Fuel-Energy Problems have estimated that, for Kuzbass to attain the levels projected by the Energy Development Program, it will be necessary in the next few years to increase the volume of construction work by one-and-a-half times, and then by three-and-a-half times! With what work force? Since no demographic boom can be expected, tens of thousands of people will have to be invited to resettle from other localities. For years, there has been talk about the need for developing mobile construction units capable of building industrial and civil facilities. The experience with the highly efficient block-complex construction method should be put to use here. Economists suggest, for example, this alternative: provisionally, the construction enterprises from other coal basins could be transferred to Kuzbass and help build a powerful base for the construction industry that would inevitably step up the pace of development of housing and services. Coal is needed by everyone, and it would probably be logical for the largest users of Kuzbass fuel, whether viewed as industries or regions, to provide assistance. For example, they could build a certain quota of housing units.

That would result in changes in the fuel output. Sociologists have found a peculiar indicator (based on an average miner's output): each new apartment unit will increase the coal output in the mines by 1,000 tons of coal per year and by more than 3,000 tons in open-pit mining.

In a nutshell, the community and housing problems of Kuzbass must be resolved at an accelerated rate. Apart from housing problems, the levels of municipal services, stores and cultural facilities are lower than in other locations. The future resettlers are in for another unpleasant surprise: the miners' salaries here are lower than in other basins, and that despite the regional differential. Such is the wise rate schedule established by the Ministry of the Coal Industry of the USSR...

Obviously, all these problems are interrelated and cannot be resolved within the framework of one industry. What is needed is more attractive conditions and diverse advantages making life in Siberia attractive.

Mikhail Gorbachev, speaking in Tyumen, mentioned the following: we should bear in mind that this is an area that is supplying and will continue to supply the nation with an increasing proportion of its material resources.

"Previously, each of the industries represented in Kuzbass viewed the region through the prism of its own narrow interests: in planning the development of its enterprises, the ministries, for example, based their estimates on the same work force," said the chief of Kuzbassugol production enterprises, V. D. Yarevskiy. "Throughout the history of Kuzbass, we have never had a comprehensive technicoeconomic program for its overall development that would precisely define the place and role of each ministry and agency concerned..."

Accordingly to the Energy Development Program of the USSR, the coal output in Kuzbass must be brought up to at least 220 million tons--one-and-a-half times the current level. This high figure is unlikely to be attained by local forces alone.

It seems that the time has come when the natural riches of the region cannot be developed and the comfortable conditions of life can no longer be created here by simple mechanical combination of the separate plans of the individual industries. What is needed is tying in coherently the interests of the individual industries in the region with those of the national economy as a whole.

9922/12899  
CSO: 1822/35

COAL

SYNOPSIS OF ARTICLES IN UGOL UKRAINY, AUGUST 1985

Kiev UGOL UKRAINY in Russian No 8, Aug 85 p 48

UDC 622.33(477.61/.62):658.65.015.25 "1935/1985"

HIGHER LABOR PRODUCTIVITY, MORE COAL FOR COUNTRY (50TH ANNIVERSARY OF STAKHANOVITE MOVEMENT)

[Synopsis of article by N. K. Grinko, pp 1-6]

[Text] The importance of coal for the country's industry. Origin of the Stakhanovite movement, its development, adherents, scientific and technical progress, socialist competition, labor productivity, social transformations.

UDC 622.272 "Donetskugol"

WORK OF DONETSKUGOL ASSOCIATION IN 11TH FIVE-YEAR PLAN

[Synopsis of article by A. P. Fisun, pp 7-10]

[Text] Description of mines of Donetskugol Association. Improving technical level of production. Adoption of scientific and technical advances. Tasks of the association in the 11th Five-Year Plan and their fulfillment. 4 Illustrations.

UDC 622.013:65.012 "Shakterskantratsit"

IMPROVING PRODUCTION CONTROL IN SHAKTERSCHANTRATSIT ASSOCIATION

[Synopsis of article by V. D. Martovitskiy, pp 10-13]

[Text] Brief description of mining-geological and mining-technical conditions in the mines of the Shakterskantratsit Association. Mine operations from 1981-1985. Improving organization of production control in the association. 2 Illustrations.

UDC 622.013:65.011.42 "Ukraina Mine"

LABOR ACHIEVEMENTS OF UKRAINA MINE COLLECTIVE

[Synopsis of article by A. I. Veklichev, pp 14-16]

[Text] Mining-geological and mining-technical operating conditions of the Ukraina Mine of the Voroshilovgradugol Association. Equipping the faces. Technical-economic indicators of mine operation. Ahead-of-schedule completion of five-year plan. 3 Illustrations.

UDC 622.232:658.387 "Mine imeni Sverdlov"

FIVE-YEAR PLAN COMPLETED AHEAD OF SCHEDULE

[Synopsis of article by V. I. Lapay, pp 16-19]

[Text] Experience of mining an anthracite formation by KM-88 system, technology and organization of operations at a longwall while loading more than 1,000 tons of coal per day. 2 Illustrations.

LABOR UNION AND STAKHANOVITE MOVEMENT IN UKRAINIAN COAL INDUSTRY DURING SECOND FIVE-YEAR PLAN

[Synopsis of article by N. V. Primush, pp 19-20]

[Text] Development of socialist competition. Izotov's achievement and its development. Origin of Stakhanovite movement and its expansion under the leadership of party organizations and labor union committees. Stakhanovite traditions.

UDC 622.83:622.273

NATURE OF MECHANISM OF DISPLACEMENTS OF SURROUNDING ROCK FOLLOWED BY REWORKING OF DRIFTS

[Synopsis of article by A. S. Chumak, V. V. Nazimko, pp 24-26]

[Text] Nature of rock displacements at the contour of principal field preparatory drifts followed by reworking of longwall drifts by unloaders at great depths; experimental confirmation of the mechanism of displacements. Principal ways of controlling the stability of drifts with the aid of technological and technical means. 4 Illustrations, Bibliography with 3 citations.

UDC 622.016.342-118:622.236.4

BLAST-FISSURE RELIEF OF FIELD DRIFT IN STEEP FORMATION

[Synopsis of article by A. S. Bratishko, N. N. Gavrish, V. L. Samoylov, A. S. Epshteyn, pp 26-28]

[Text] Results of experimental research under production conditions of steep slope of blast-fissure relief of field drift subject to the impact of mining operations. 3 Illustrations.

UDC 622.273.212.34+622.28.048.4

#### USE OF RUBBLE-CHOCKS ALONG THE FACE OF LONGWALLS

[Synopsis of article by M. A. Chernikov, Yu. I. Rudnitskiy, V. M. Okolot, pp 28-29]

[Text] Results of utilizing rubble-chock rows on longwalls with individual and mechanized support. 2 Illustrations.

UDC 622.013

#### DAY PER MONTH GAINED BY ECONOMIZING MATERIALS

[Synopsis of article by Yu. A. Sapelnikov, pp 29-30]

[Text] Front-rank work experience of I. K. Sharov's working-face miners' brigade in the Mine imeni Lenin of the Rostovugol Association. 1 Illustration.

UDC 622.232.063.46.001.13

#### QUANTITATIVE METHOD OF EVALUATING TECHNICAL, TECHNOLOGICAL SOLUTIONS FOR UNMANNED COAL MINING

[Synopsis of article by P. Ye. Levkovich, V. I. Meznikov, pp 31-32]

[Text] Method of evaluating proposed simplified way of determining an integrated indicator that does not require expert sampling. Bibliography with 3 citations.

UDC 622.232:658.387.4 "Glubokaya Mine"

#### IMPROVING EFFICIENCY OF COAL EXTRACTION AT LONGWALL

[Synopsis of article by Yu. I. Litvinov, pp 32-33]

[Text] Work organization and achievements of GROZ /working-face miners'/ brigade headed by L. I. Prokopov of Glubokaya Mine of Rostovugol Association.

UDC 622.238.8

#### INTEGRATED MECHANIZATION OF MINING OPERATIONS AT MINE IMENI KALININ

[Synopsis of article by M. G. Sinko, L. I. Bucharskiy, I. M. Vedmedyev, pp 33-34]

[Text] Use of 1KGU, 2KGU, KGU-D and ANShch mechanized systems to work steep formations. Operating conditions and technical-economic indicators obtained when using the systems in a mine, their advantages and shortcomings, and improvements introduced by production workers.

UDC 622.232.72

#### INDUSTRIAL TESTS OF K-10 COMBINE

[Synopsis of article by V. B. Sankin, V. A. Khirov, N. T. Tenishev, pp 35-36]

[Text] Conditions for using and technical description of experimental model of K-10 formation-mining combine with a capacity of 1-2.5 meters at an angle of incline up to 35 degrees. Results of industrial tests at the Molodo-gvardeyskaya Mine of the Krasnodonugol Association. 1 Illustration.

UDC 622.678.53.067.001.4

#### USE OF MODERNIZED LOADING DEVICES WITH VERTICAL HOPPER-FEEDERS

[Synopsis of article by S. S. Safonov, A. I. Solomentsev, V. M. Cheppel, pp 36-37]

[Text] Main shortcomings of standard type ZU skip ladle device and need to replace it with type ZUM modernized skip ladle device, experimental models of which have been installed and tested at the Mine imeni Voroshilov of the Dzerzhinskugol Association. 1 Illustration.

UDC 622.673.1

#### ACCIDENT-FREE OPERATION OF HOISTS WITH POWER BRAKES

[Synopsis of article by A. I. Shishkov, V. I. Samusya, pp 37-38]

[Text] Need to limit braking momentum when speed of hoist movement exceeds safe speed for sudden braking. Experimental model of unit for automatic limitation of braking momentum, in-mine experiments. 2 Illustrations.

UDC 622.51:628.33/.35:622.3:502.76

#### ENVIRONMENTAL PROTECTION AND USE OF RECYCLED RESOURCES IN COAL INDUSTRY

[Synopsis of article by P. I. Marosin, pp 39-40]

[Text] Abridged presentation of report at Seventh Plenum of URP NTO /Administration for the Distribution of Publications of the Scientific and Technical Society/ of the Mining Industry. Conservation and rational utilization of water resources, protection of air and minerals, utilization of soils, solid mineral wastes and recycled resources.

UDC 622.51:628.33/.35

ENVIRONMENTAL PROTECTION, RECYCLED RESOURCES

[Synopsis of article by V. G. Geyer, pp 40-41]

[Text] Abridged presentation of final report at the Seventh Plenum of UPR NTO of the Mining Industry. Contribution of NTGO /Scientific and Technical Mining Society/ to the solution of the problem. Environmental Protection Service, innovative brigades.

UDC 622.678.5

REBUILDING HOIST SYSTEMS OF SHAFTS EQUIPPED WITH TIPPING CAGES

[Synopsis of article by I S. Adonkin, F. M. Streshinskiy, L. L. Kaufman, pp 42-43]

[Text] Basic design solutions for rebuilding hoist systems for shafts equipped with tipping cages. 2 Illustrations.

UDC 622.693.6.004.3

LOADING AND STORING COAL AT YUZHNOBASSKAYA MINE NO. 3

[Synopsis of article by A. I. Goldberg, T. S. Khugayev, p 44]

[Text] Loading hoppers and loading systems; UP-R type device for continuous loading of coal and feeding into railcars. 1 Illustration.

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CSO: 1822/358

ALTERNATE FUELS

SOLAR POWERED WATER HEATERS UNDER STUDY

[Editorial Report] Tashkent SOVET OZBEKISTONI in Uzbek on 28 August 1985 carries on page 3 a 1,200-word article by Gh. Umarov, corresponding member of the Uzbek SSR Academy of Sciences, entitled "Subordinating the Sun" in which he discusses some of the research at the academy's Institute of Physics and Technology on questions of the interaction of the sun's rays and soil. At the end of the discussion he notes that workers at the institute have produced several variants of units that heat water with the help of the sun's rays. These units are basically intended to heat water for housing, municipal, and agricultural facilities. Experiments show that such units can satisfy hot water needs for 7-8 months of the year. In the next 5-year plan solar powered water heaters will be used in agriculture.

/9716  
CSO: 1836/412

NUCLEAR POWER

DECREE ISSUED ON SAFETY IN NUCLEAR POWER ENGINEERING

Moscow SOBRANIYE POSTANOVLENIY PRAVITELSTVA SOYUZA SOVETSKIKH SOTSIALISTICHESKIKH RESPUBLIK in Russian No 19, 1985

[Amendments to USSR Council of Ministers Decree No 409 (4 May 1984) on confirming a statute concerning safety in nuclear power engineering]

[Text] Confirmed by USSR Council of Ministers Decree No 489, 29 May 1985.

Amendments inserted in the Decision of the USSR Government relating to the USSR Council of Ministers Decree No 409 of 4 May 1984: "Regarding Confirmation of the Statute on the USSR State Committee for Safety in the Atomic Power Industry":

1. Subsection (a) of section 3 of the USSR Council of Ministers Decree No 105 of 23 January 1981: "Concerning the Formal Acceptance of a Project for Operation upon the Completion of its Construction" (SOBRANIYE POSTANOVLENIY, No 7, 1981, p 43), to be supplemented with the following line:

"...projects under the control of Gosatomenergonadzora organs, the representatives of these organs."

2. In the Statute on the USSR State Committee for Supervision of Safe Working Practices in Industry and for Mine Supervision, confirmed by USSR Council of Ministers Decree No 232 of 25 March 1982 (SOBRANIYE POSTANOVLENIY, No 11, 1982, p 64):

(a) Paragraph 4, section 2 to be supplemented with the following words: "(including lifting equipment for nuclear power engineering projects and emergency start-up boiler-house equipment)";

(b) In subsection (i) of section 6 and subsection (r) of section 7: to exclude the words: "nuclear power engineering";

(c) In subsection (k) of section 6 and in paragraph 2, subsection (o) of section 7: to exclude the words: "equipment for nuclear power engineering";

(d) Paragraph 5, subsection (z) of section 2, and paragraph 4, subsection (s) of section 6, to declare that they had lost power.

NUCLEAR POWER

CHIEF ENGINEER CITES CONSTRUCTION PROBLEMS AT SMOLENSKAYA AES

Moscow TRUD in Russian 19 Jul 85 p 2

(Article by V. Yefimenko, chief engineer of the Smolenskaya AES Construction Administration: "The Conveyor of Atomic Giants: The Rhythm of a Key Construction Project")

*[Text]* The year of active preparation for the regular 27th CPSU Congress was marked at the construction of the Smolenskaya AES by a great labor victory--the turning over for continuous operation of the facilities of this station's first phase, consisting of two power units.

Since 4 May the second "millionaire" power unit of the Smolensk AES has been operating under an industrial load. It has been confidently picking up capacity, which has already reached a million kilowatts. Since the day it started up, this unit has delivered to the consumers more than 900 million kW-hours of electric power.

Having entered upon the key, pre-congress tour of duty, the builders are mastering the new construction site, on which the facilities of the AES's second phase are under construction. In contrast to the first two, both of the "millionaire" units of the second phase are planned to be built simultaneously, by the so-called assembly-line method, making the maximum use of industrial construction technology and the progressive forms of labor organization.

The groups of power-engineering builders are striving to over-fulfill the plan with regard to labor productivity by at least one percent. Not by the number of workers but rather by skillful organization of labor and production will we solve the problems confronting us--such is the slogan of the pre-congress competition. It is intended to save considerable amounts of resources, which will allow a minimum of two days a year to be spent on them.

For the day of the congress's opening intensified pledges have been made regarding the construction of the station's main building. The plan for the first two months of 1986 on the facilities of the main building will be fulfilled ahead of schedule, by 25 February.

Less than three months ago the first phase of the Smolenskaya AES, with a total capacity of two million kW, was turned over for operation. Building its facilities took two five-year plans. Of course, we must take into consideration the fact that here in this relatively remote and deserted corner of the Smolensk region a construction base was also created, and a settlement was built for 35,000 inhabitants. But even so, this time period was impermissably long. The first unit was under construction for a long time--ponderously and, to a large extent, in a routine manner; the second unit went up quite a bit more rapidly and more intelligently. However, let's not delude or flatter ourselves: there were no principled or major improvements in the construction process.

Now we are faced with the task of constructing, during the same time periods, in the course of the two upcoming five-year plans, two more phases of the station, four "millionaire" units. Will we be able to cope with this task if we build each unit as before, individually, in sequence, beginning each time from point zero, and repreating everything which has been done already? There can be no doubt about the answer in this case: we will not be able to. That is why, as we were finishing up the second unit and defining our tasks for the future, we came out with the suggestion to subsequently shift the construction of the new units onto an assembly-line basis, to impart to construction the nature of an integrated technological process.

It should be noted that what we are talking about is a complex and large-scale restructuring. Earlier, for example, upon finishing up a regular phase of operations, we removed from the project the people and equipment which had been freed up and threw them into working on other sections, at times secondary ones, only to return all this to the site when it becomes time to work on the next unit. In the assembly-line method both units will be an integrated construction project, except that the first unit must be built with a certain head start. Those same machines and those same brigades, for example, having come full cycle on one section, would be transferred a minimal distance and would start right in to work on the second unit. In short, while building the first unit, we should, at the same time, start getting under way on the second one. According to our calculations, the assembly-line method would allow a speed-up by a factor of 1.3 in introducing new electric-power engineering capacities.

It would seem to be an obvious solution, so why did we not think of it before? But, in reality, many extremely complex conditions are necessary in order to organize an assembly line. This entails, first of all, the availability of a unified plan for the power units of a nuclear-power station with an RBMK-type reactor, as well as obtaining technical documentation within strictly stipulated time periods. During construction of the first two units the general planner--the Gidroproyekt Institute--often misled us; they issued and supplied us with blueprints and estimates which missed their deadlines, were unsystematic, caused stoppages of the brigades and equipment, and this forced us to disrupt the sequentiality of the operations.

A second condition of no small importance is the expansion of our production base. We must modernize the existing capacities and create new ones for the construction industry, as well as outfit them with the most up-to-date technological, hoisting and transport, machine-tool, and other equipment, monitoring and measuring devices, etc. We were confronted with this problem even during the construction of the first power unit; however, the USSR Ministry of Power and Electrification did not solve it. As a result, the construction project was compelled, for example, to obtain from outside, from distant cities, an enormous number of reinforced-concrete items, instead of producing many of them at the site.

The third decisive factor is the application of the most progressive methods of organization and technology of construction-and-installation work, allowing us to utilize machines and mechanisms with greater efficiency and to reduce labor expenditures. Here, of course, it is we ourselves who must utter the decisive words. The list of our measures is diverse and wide. It includes the maximum pre-installation consolidation of the units, their preliminary testing at special positions, a high degree of plant prefabrication of the units and assemblies, the widespread use of reinforced panels with "dry" joints in erecting the main building, placing concrete by means of pumps, etc. For example, previously we delivered all materials, units, panels, etc. to the installation sites by truck transport. That means that the limit of the prefabrication of structural components was determined by the freight-hauling capacity of the truck. Subsequently, it was decided to extend a railroad branch line into the zone of operations. It will be used for shipping in the larger structural components with a high degree of readiness for installation.

Naturally, in a comprehensive plan all the parts are important. Insignificant items left unfinished can reduce to nothing the effect of large-scale measures. Therefore, in the implementation of our plans a large role will be played by the completeness and timeliness of deliveries, the guaranteed supply of working personnel, the widespread use of brigade contracts, etc.

These are no longer rough drafts nor merely good intentions but rather constitute a precise, detailed program, mandatory for all the performers involved. The development of proposals and technical measures with regard to converting the construction of the second and third phases of the Smolenskaya AES to the assembly-line method was completed at the beginning of this year. Taking part in it, along with the planning institutes, the directors of the station, who are the clients, the contracting and sub-contracting organizations, were about ten ministries and departments involved in creating new capacities at our AES. Then the measures were thoroughly studied in the USSR Ministry of Power and Electrification. At this time the initiative for the construction project has already been confirmed by an order of the ministry. This document specifies the volumes of the operations and those who are to perform them, outlines the intended time periods, indicates the suppliers of material resources, etc. Our proposals with regard to the organization of assembly-line construction have been approved in the USSR Council of Ministers.

The group at our administration stands at the end of the complex and large chain of performers. Everything will be provided and guaranteed for us, but the colossal volume of work, amounting to 1,063,000 rubles, with regard to the

industrial construction of the second and third stages will fall on our shoulders.. We must find within ourselves the boldness, strength, and energy to restructure engineering and economic thinking, master construction methods which are new in principle. Building the second unit was very instructive to both the engineering group of the construction project and the workers' groups. We are encouraged by the penchant for original and bold engineering solutions, for a creative style of work, for seeking out reserves. It is important now to develop, strengthen, and expand this tendency. It is precisely on this that the administration, party, and trade-union organization of the construction project are now working.

Carrying out the intended program of assembly-line construction will be our contribution to the intensification of this sector.

2384  
CSO: 1822/326

NUCLEAR POWER

#### PROBLEMS AT ROSTOV AES CONSTRUCTION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian, 7 Jul 85 p 1

[Article by M. Dyadkov, brigade leader, Volgodonskoye Administration, Gidromontazh Trust: "Even Though It's All Under the Same Roof...."]

[Excerpts] A look at things at our level, the brigade level, might lead you to believe that everything was going smoothly. When a recent heavy rain filled up a shaft and put an end to work on the assembly and installation of an elevator, neighboring crews even came over during their lunch break to help us pump the water out so we could carry on with our work as expeditiously as possible. Two days later we in turn responded to a call from our neighbors to help them move a 53-meter reinforcing unit into position so they could get their concrete poured.

If you look at the assembly and installation work we've done in terms of tons, you'll see that we met our targets for both April and May. The problem is that the work we did was not the work called for or when or where it was called for by the coordinated operations schedule. One of the results was that A. Gorba-chev's brigade was able to pour only half as much concrete a month as it could have. So overall we in turn accomplished only half as much as we should have.

We are leaving our neighbors in a bind because the "work relay" begins with us and ends with us. For the fact is that we are only the first link in the chain. We get the metal structures we're supposed to assemble from a combined fabrication facility which is an independent operation within our own Gidromontazh administration. It employs four individual brigades to do its assembly work—one will make the basic unit, another the wall components and so on. In other words, each brigade specializes in its own type of structure, so it will frequently be the case that they will send us not what the schedule says we need at the construction site at that particular point, but rather what they have on hand to send us at the time. We always get everything we order sooner or later, of course, but the idea is to get us what we need when we need it. Units we receive out of order will occasionally remain untouched at the construction site for weeks while we wait for what we really need, or, contrary to the requests of the general contractor we will once again be operating in the wrong square.

8963  
CSO: 1822/282

NUCLEAR POWER

ROSTOVSKAYA AES SUPERVISOR REQUESTS END TO EXPERIMENT, DELAYS

Moscow SOTSIALISTICHESKAYA INDUSTRYYA in Russian 7 Aug 85 p 1

[Article by K. Isayev, administration section chief of Atomenergostroy, Volgodonsk, under the rubric "Our Correspondence Post at the Construction Site: the Rostovskaya AES": "Experiment without Recognition"]

[Excerpts] Brigade leader Pavel Tokarchuk and I returned from Balakovo "wound up." We were convinced ourselves that our colleagues at the Balakovskaya AES [Nuclear Power Plant] construction site had it better. We understood that we, too, had to reorganize ourselves. That was the reason they had sent us for the experience.

We soon figured out the reason: it wasn't just the concrete. Our building assembly line had broken down: one brigade collected metal structures for the reactor unit, another did installation work, a third worked with concrete. But the Balakovo people took the whole thing in hand as a group. And at once they were free of the countless coordination problems, mutual complaints and misunderstandings that cause us to lose so much time.

They have fewer people working on the project, if you count carefully, but they get more done. They gain because they do not have to wait for each other. When it is needed, they can always transfer people to assembly, installation or concrete work -- depending on where a stepped-up pace is needed at that moment. Their accounting is general: not in tons of cut and welded fittings, not in blocks of concrete, but in finished testing units, in final results.

When we returned from Balakovo, P. Tokarchuk immediately organized in his brigade instruction in welding by the bath process, which is essential for assembly work. I began to calculate. It turned out that not too much would be required for us to reorganize ourselves. Give us the territory for assembly work, the technical specifications and the metal, and let us work. Gradually, as the work turns out, we will need to increase our forces on the second unit, but now, for the beginning, the workers we have suffice. With this I went to the management of Atomenergostroy -- to administration chief A. Trofimenko and chief engineer A. Usov. The answer was discouraging and frank: experiment, they said, is a good thing and initiative is a good thing, but why do we need extra worries?

It is true, a month ago, when the question of rebuilding was brought up and the workers themselves all supported it at a general meeting of the section, Atomenergostroy chief A. Trofimenko seemed to agree. But that was all. More than a month has passed and no practical steps have been seen.

At the majority of nuclear power stations under construction today, as in Balakovo, the reactor unit is being built by a single general contracting section, powerful in terms of numbers and strongly qualified. In our Rostov station, by way of experiment, Soyuzatomenergostroy, with the consent of USSR Minenergo [Ministry of Power and Electrification], turned over the installation part of the work to Gidromontazh Trust. We have been floundering in this experiment for a few years now without any visible success. It is high time we drew some conclusions.

To take the whole assembly line in our own hands now would mean to provide the all-round contract, the pace, and the regular production line construction about which we have so far only heard conversations.

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CSO: 1822/347

NUCLEAR POWER

BRIEFS

DELAYS AT ATOMMASH--"SOTSIALISTICHESKAYA INDUSTRIYA at Atomash" in issue No 30 (342) opens with an editorial called "The High Price of Wavering," in which the building and installation work delay of the first half year was noted. The uneven allocation of work volume per month and the long vacillation at the beginning of the year are the reasons which, in spite of last month's notable successes, have led to an underfulfilled quota. Atomash builders and assemblers should mobilize all their strength and resources to unconditionally complete the annual plan and fulfill their socialist duties, it was emphasized in the article. An article by Atomash party committee deputy chairman V. Balasyuk, headlined "It is Decided on the Spot," was published under the rubric "Party Life: Accounts and Options." The author analyzes the activity of party groups in future production improvement and tells about the work of communists in the advanced primary party organizations of enterprises. Last winter in Volgodonsk was unusually cold for the south. It caused serious interruptions in the work of a number of enterprises. In the article, "A Severe Lesson," V. Dorofeyev, chief engineer at a concrete mixing plant, tells about the collective's preparations for winter work. Also published in the issue were articles by Atomash brigade leader V. Dengin -- "A 'Secondary' Order," and by correspondent A. Zornin -- "At the Red Light," plus answers to readers' letters by V. Silchenko, department chief of the Volgodonsk Special Planning, Design and Technical Bureau of Energomontazhremont -- "The Effect of Scientific Search." Also in the paper was Kuzma Volgodonskiy's satirical article: "A Crane on Vacation." [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA 25 Jul 85 p 2] 12962

NEWS FROM ATOMMASH--This year Atomash builders are working better than last. They are assimilating more capital investments and have increased the volume of construction and installation work. However the plan for July was not fulfilled, as was noted in the editorial published under the headline "Overcoming Delay" in the column, "SOTSIALISTICHESKAYA INDUSTRIYA at Atomash" -- issue No 34 (346). One more reactor housing, the fourth, is being prepared for shipment to Khmelnitskaya AES [Nuclear Power Plant]. An article by correspondent Z. Bibikov, "The Last Step," tells how the work is going. Also published in the issue were articles by correspondents D. Pryamikov, chief engineer of the Volgodonsk Administration of Kavzantekhmontazh -- "One in the Field is not a Warrior," V. Antipin, deputy chief of computer work administration for Atomash -- "Service," and G. Savenkov, chairman of the trade

union committee of the house-building combine -- "Formalism is not Tolerated." The reader will become acquainted with news of cultural and every-day life. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRiya in Russian 22 Aug 85 p 2] 12962

SUCSESSES AT SMOLENSK AES--Smolensk Oblast--Since the beginning of the year, the Smolensk Nuclear Power Plant has turned out 1.5 billion kWh of electric energy above the plan. In honor of the upcoming party congress, the power workers' collective adopted a new increased commitment: to fulfill the annual plan ahead of schedule -- not by 29 December as was first projected, but three days earlier --and then to use the nuclear fuel they saved to finish their work in the days left. "The collective's success is natural," declared Smolensk AES Director Yu. Sarayev to our correspondent. "At the end of May of this year the second million-kilowatt power-generating unit was put into operation in excellent technical condition. The high level of domestic equipment and the increased demands for quality in construction and installation work, which exclude even the smallest error, all have enabled us to finish the launch period in two months rather than the normal four. Then operating personnel accepted a builders', assemblers' and adjusters' competition. A total of two months were needed to bring the new power-generating unit up to planned capacity. Normally a half year is permitted for this. Now a crucial time has come for the Smolensk Nuclear Power Plant collective. The first power-generating unit, which has been running smoothly a full year, is shut down for its regularly scheduled preventive maintenance. We have been preparing for this since the beginning of the year. Precise schedules for the interaction of all services have been compiled, and mechanisms, spare parts and equipment have been prepared in advance. The maintenance work has begun. The plant's collective has decided to finish it in 30 days instead of 40 as projected in the plan. [By E. Georgiyev] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRYA in Russian 21 Aug 85 p 1] 12962

ATOMMASH INCENTIVE--How is the system to be improved for providing incentives to the participants in the socialist competition at the construction of Atom-mash? This question is answered in the article published in this issue entitled "What Is Represented by a Bonus?" by Z. Rassadkina, the chief of Zavodstroy's Labor and Wage Division. Sociological studies are being carried out at Atom-mash on an increasingly larger scale. The results achieved are talked about in the article entitled "Accent on Publicity" by G. Sergeyev, candidate of philosophical sciences and senior lecturer in the Department of Marxism-Leninism at the Volgodonsk Branch of the NPI/Novocherkassk Polytechnical Institute imeni Sergo Ordzhonikidze/. Also published in this issue are the following: the article entitled "The Injection Method" by L. Maslovskiy, construction superintendant at the Gidrospetsstroy's Volgodonsk Administration, the letter to the editors, entitled "They Hid behind the Paragraphs," by O. Volkov, the deputy chief of a home-building combine, and replies to critical statements. [Excerpts] [Moscow SOTSIALISTICHESKAYA INDUSTRYA 19 Jul 85 p 2] 2384

NEW UNIT FOR ZAPOROZHSKAYA AES--Two weeks ahead of schedule the group at the Turboatom Kharkov Production Association shipped out a unit with a capacity of a million kilowatts for the third power unit of the Zaporozhskaya AES. Such a result was achieved by the turbine builders due to the introduction into production of highly productive equipment and the optimum technology, based on the certification and rationalization of the jobs involved. [By V. Zenkovskiy, correspondent, Kharkov] [Excerpt] [Moscow SOTSIALISTICHESKAYA INDUSTRYA 20 Jul 85 p 1] 2384

NEW LENINGRAD STEEL MILL--The first steel plate has come off the rolling tables of the country's largest "5000" steel mill, which was erected in the Izhorskiy Plant Association. [Text] [Moscow EKONOMICHESKAYA GAZETA No 28, Jul p 3/ 2384

KURSK PLANTS SHORT ON DELIVERIES--The Dnepr Plant for Reinforced-Concrete Products and Structural Components and the Kurchatov Structural Components Combine of the Kursk AES Construction Administration have not been fulfilling their contractual obligations. The construction projects supply people have been unable to "squeeze out" of these plants all the stipulated precast concrete. The amounts "owed" keep on piling up. During the first four months of this year the Dnepr Plant was supposed to deliver to the construction site of the Smolensk AES 2,612 cubic meters of reinforced concrete, but it shipped out only 1,674 cubic meters. The Kurchatov Combine delivered only 1,150 out of 1,980 units of reinforced panels. Furthermore, they frequently shipped out not those products which the customer needed but rather finished items which were in their warehouse. The construction projects party committee addressed a letter to the management of the Soyuzatomenergostroy V/O, in which it requested the comrades from the above-named plant and combine included within this V/O to keep the plan discipline in mind. Not a peep in reply; the pace of reinforced-concrete deliveries has remained as before, unsatisfactory. [By G. Gromyko, correspondent] [Moscow TRUD 19 Jul 85 p 2/ 2384

TURBOGENERATOR FINISHED FOR IGNALINSKAYA AES--(LenTASS)--A capacity of 3 million kW will be attained by the Ignalinskaya AES after start-up of the turbogenerator which has just been finished at the Elektrosila Association. The Lithuanian electric-power engineers have recently brought this station's first unit up to its rated capacity. The new power machine is intended for the second unit. The Elektrosila generators which have been supplied to the Ignalinskaya AES are distinguished for their extremely high technical level. They are being included in an integrated series of machines which have a reduced metal consumption and an increased reliability. By mastering the production of such equipment the association is making a substantial contribution to speeding up the pace of scientific and technical progress, to the development of the country's nuclear-power engineering. In accordance with the "Intensification-90" program, the Elektrosila people will produce another four turbogenerators for the Ignalinskaya AES. [Leningrad LENINGRADSKAYA PRAVDA 12 Jul 85 p 2/ 2384

NEW OBNINSK NUCLEAR INSTITUTE--A new Institute of Atomic Power Engineering has been established in the city of Obninsk, which is also the site of the USSR's first nuclear power station. According to Yu. A. Kazantsev, rector of the institute, the purpose will be to raise the qualifications of specialists at the highest level in the design, assembly and exploitation of nuclear power plants. Cybernetics engineers in the nuclear field will also be amongst the trainees. Eventually the institute should accommodate over 2000 students and support staff. The institute is affiliated with the Moscow Engineering-Physics Institute, and will also be associated with institutes in the city of Obninsk. [Summary] [Moscow Television Service in Russian 1813 GMT 1 Nov 85]

NEW KHARKOV ATETs--Kharkov, 3 Jun 85--The groups at the Yuzhtransstroy and Yu-gozapadenergostroy Trusts have begun preliminary operations with regard to building the nuclear heat and power station (ATETs). The Kharkov Turbine Plant Association imeni S. M. Kirov will manufacture two economical "millionaire" turbines for it. The new station has two purposes. It will provide electric power for the enterprises of Kharkov, Poltava, and Sumy Oblasts and, at the same time, will supply Kharkov with a large amount of hot water to enterprises for technical needs and for supplying the city with heat. The plan for this ATETs has incorporated the latest scientific and technical achievements in the field of nuclear-power engineering, automation, and computer technology. [By I. Lakhno, PRAVDA correspondent] [Text] [Moscow PRAVDA in Russian 4 Jun 85 p 1] 2384

SHEET MILL UNDER CONSTRUCTION--The Izhorskiy zavod Association is stepping up construction of what will be the country's largest sheet-rolling complex, which will incorporate the one-of-a-kind "5000" mill. Builders are closing in with all confidence on their objective of fulfilling socialist obligations to bring the first phase of the gigantic new mill into operation 6 months ahead of schedule. Association workers have resolved to bring the first stage of the new sheet-rolling facility, which will have a capacity of 120,000 tons of rolled products a year, into operation ahead of schedule. Test rolling is planned for the end of the first and the beginning of the second 6-month period. The Izhorskiy zavod Association is the primary supplier of equipment for all atomic power plants both in operation and under construction in our country and the fraternal socialist countries. The new "5000" mill will be able fully to meet the association's rapidly growing demand for products rolled from high-strength steel. It will offer an unprecedentedly broad range of product dimensions--up to 5 meters in width and 10-450 mm thick. The use of large sheets and plates in place of forged billets will make it possible for the power-machine builders to achieve economies running to a thousand tons of metal per "1-million" reactor. Savings will be in the neighborhood of 1.5 million rubles. The complex in accordance with factory program "Intensification 90" has been outfitted with the most modern equipment with automated control of production processes. Moreover half of the equipment needed for the mill was made by the Izhor workers themselves. [By SOTSIALISTICHESKAYA INDUSTRIYA special correspondent V. Ponomarev, Leningrad] [Excerpts] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Jun 85 p 1] 8963

SMOLENSK PLANT ADDS CAPACITY--The unified power system for the European part of the country has seen another increase in capacity with the start-up of the second phase of the Smolensk atomic power plant. Construction has been completed on the first phase of the facility, which has an overall capacity of 2 million kilowatts. [Text] [Moscow EKONOMICHESKAYA GAZETA No 23, Jun 85 p 3] 8963

SECOND PHASE ON LINE AT ZAPOROZHYE PLANT--Energodar (Zaporozhye Oblast), 4 [Jul]--The 1 million kilowatt-capacity second phase of the Zaporozhskaya AES has supplied its first commercial power. As compared with the first unit of the facility, the cost of this unit has been cut by almost 30 per cent. [By PRAVDA stringer I. Sergeyeva] [Excerpt] [Moscow PRAVDA 5 Jul 85 p 1] 8963

IGNALINA FACILITY IN SERVICE--The 1.5-million kilowatt first stage of the Ignalina (Lithuanian SSR) AES has now been brought to design capacity. The world's power industry has yet to see another unit of this capacity in operation.  
[Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 22, May 85 p 4] 8963

NEW SERVICE FROM KALININ PLANT--A 750-kilovolt line from the power engineers' city of Udomlya to Vyshniy Volochev is now carrying power from the AES in Kalinin. This AES is linked to the main power line running between Moscow and Leningrad. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 25, Jun 85 p 3] 8963

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NON-NUCLEAR POWER

UDC 621.311.22-63.003

RESOURCES FOR SAVING OIL IN TES FUEL OIL BOILER-FIRING SYSTEMS

Moscow ELEKTRICHESKIYE STANTSII in Russian No 7, Jul 85 pp 13-16

[Article by M.S. Lykhovetskiy, candidate of technical sciences, All-Union Thermal Engineering Institute]

[Abstract] High fuel losses have been noted in TES [Thermal Electric Power Station] boiler-firing systems. Some losses have approached 10,000 t per year, in varying firing systems. Tank "breathers," errant tank measurements and steam losses from fuel heating and equipment steaming also lose fuel. Losses here can be accounted for with steam flowmeters and by improved monitoring of breathers and level gauges. Low steam pressures and temperatures call for the use of more steam. The solution is to install extra heaters, though this uses more steam. Improperly operating heat-exchanger condensation traps give off a steam-water mixture, thus using more steam. Here, the traps should be adjusted. Fuel oil also takes on much moisture as outdoor tanks are drained from steam-heated drain racks. Often, enough water is introduced into the oil to extinguish the firing flame. This is solved by bleeding off water into settling tanks with fuel-oil traps. This can save R100,000 per year. Constant operation of fuel-oil recirculating systems loses much thermal and electric power. These systems run practically idle for gas boilers in the summer. Where steam is run through the system at all times, the drain rack is enveloped in fog, and dangerous ice forms on the rack platforms. Research on electric heaters has found them to be more reliable. The problems of irregular fuel-oil train arrivals and tank-farm storage shortages leads to problems. This can be resolved by enlarging the tank farm when renovating the TES. The most effective way to reduce heat and fuel losses is to build enclosed shelters for warming, draining and cleaning tank cars. There are environmental protection and personal safety advantages as well. Steam and fuel consumption is also reduced, and sizable sums of money are saved. The only capital outlays are for shelter construction. Implementation of the above measures should effect the desired result. References 9 (Russian).

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NON-NUCLEAR POWER

MOSCOW TETs-23 MODERNIZATION IS EXAMPLE OF WINTER PREPARATIONS

Moscow EKONOMICHESKAYA GAZETA in Russian No 29, Jul 85 p 6

*[Article by A. Mishin: "Power Engineers Prepare for Winter: Winter Makes Rigorous Demands"]*

*[Text]* Moscow's power engineers are actively preparing for the upcoming autumn and winter season. Schedules of repair and preventive maintenance operations have been compiled ahead of time at all the heat and power stations. Modernization of a number of power units and boiler units is being carried out. Mosenergo [Moscow Fuel and Power and Supply Administration] regularly keeps track of the progress being made in executing the indicated programs.

An example has been shown by the group at TETs-23. This heat and power station is the largest not only in the capital but for the entire country. It serves seven districts in Moscow with a population of 1.5 million, as well as numerous enterprises.

This TETs has installed four turbines of 100 megawatts each and an equal number with 250 megawatts each. Every year it delivers to its customers about 9 billion kW-hours of electric power, more than 360 billion cubic meters of hot water, and more than 10 million gigacalories of heat.

"The group at the TETs-23 worked well during the past heating season," states N. V. Makarov, the deputy chief engineer of the heat and power station. "There was not a single break in the operation, and the dispatcher's heating schedule was strictly observed. The expenditure of fuel per kW-hour amounted to 220.2 grams instead of the normative amount of 222. It is intended to operate just as reliably during the upcoming season."

For this purpose, in addition to repairs and preventive work on the basic and auxiliary equipment, it is necessary to carefully heat the buildings, check out the strength of the heat outlets, and prepare the necessary reserve supply of fuel. Crash work is being done these days by the brigades of B. Smirnov and V. Bryukhin from the centralized repair workshop.

While concerning themselves about the operational reliability of the equipment, the specialists and innovators at the TETs-23 are striving to improve its economies as well. Thus, the efficiency experts, in conjunction with the staff members of one of the scientific research institutes, developed the

technology for modernizing the packing gaskets of the network pumps. As calculated per power unit, this will conserve almost 10,000 rubles. This result of an innovative search has been marked by a certificate of the VDNKh SSSR [Exhibition of USSR National Economic Achievements].

The progressive group, in successfully carrying out its socialist pledges, made economies amounting to 12,000 tons of standard fuel over a six-month period. The chief reserve was found in reducing the losses of escaping gases, steam, and condensate. A large effect has also been obtained from using the operation, mastered at the TETs-23, of the turbine-unit equipment in the heating-plant system, in connection with which optimum use is made of secondary energy resources. Here for the first time use began to be made of processing the water with sodium silicate, which increased the efficiency of the preheaters.

During the present year the power engineers of the TETs-23 decided to operate for two days on reserves saved in excess of the plan. On 9 May the half-way mark was reached in the fulfillment of this pledge. According to the calculations of the economists, the full amount should be successfully implemented in August in honor of the 50th anniversary of the Stakhanovite Movement.

Thus, a reliable start has been made toward fulfilling the pledge recently adopted by the TETs-23 as follows: on 25 February 1986--on the day when the 27th CPSU Congress opens--to likewise operate on resources saved in excess of the plan.

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NON-NUCLEAR POWER

BRIEFS

PRE-WINTER PREPARATIONS AT SURGUTSKAYA GRES--In becoming acquainted with the operation of the SURGUTSKAYA GRES /in boldface/ [State Regional Electric Power Station], the journalists discovered that the minimal level of fuel expenditure has been achieved here since the station began operating. At present to produce one kW-hour of electric power less than 336 grams of fuel--two grams less than the norm--are required. But the most substantial economies lie ahead--after construction of the GRES-2 is finished. In contrast to GRES-1, which has power units with a capacity of 210,000 kW, it was decided to set up units with a capacity of 800,000 kW. Their efficiency is much higher, and they consume fewer resources. With the final introduction of GRES-2 within a year, at the very same output of electric power as at the first station, it will expend 600,000 tons of standard fuel less. "Delayed construction of the basin's facility for cooling the water of Unit 15 has led to a decrease in power output. We are burning tens of thousands of tons of fuel uselessly because of the fact that, up to now, we have not completed installation of the indraft ventilation in the main building." [Excerpts] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 23 Jul 85] 2384

CONSTRUCTION PROGRESS AT MUBAREKSAYA TETs--Installation of the principal technological plant--the second boiler unit--has begun at the Mubarekskaya TETs /heat and electric power station/. The second unit of the Mubarekskaya TETs will be similar to the first: a boiler producing 500 tons of steam per hour and a turbogenerator with a capacity of 60,000 kW. The calculated deadline for starting up the boiler is October, and for that of the turbine--December of the present year. Introduction of this new unit will allow us to substantially increase the delivery of steam to the Mubarek Gas-Reprocessing Plant. And this means that, on the eve of winter, there will be increased deliveries of fuel to the national economy of five republics, and more sulfur will be received by chemical plants producing mineral fertilizers. As reported in the Uzbekgidroenergostroy Trust, the pace which has now been adopted guarantees the completion of everything which has been outlined, particularly if Sredazelektromontazh finally receives the anticipated personnel aid: at least an additional brigade of skilled installation workers must be sent here. [By V. Shumaylov, UzTAG correspondent, Mubarek, Kashkadarskaya oblast] [Excerpts] [Tashkent PRAVDA VOSTOKA in Russian 9 Jul 85 p 1] 2384

CONSTRUCTION PROGRESS AT PERMSKAYA GRES--The first energy unit of the Perm-skaya GRES, having a capacity of 800,000 kW, which was initially planned to start up in December, is now supposed to produce current in October. It will be called upon to play a notable role during the time of maximum autumn-winter demand for electric power. Speeding up operations in all manner of ways on the facilities of this unit constitutes the present agenda. For example, installation of the boiler, requiring 18 months in accordance with the norm, must be carried out in less than half that time. And so, the installation of the boiler is the linch-pin of the future start-up. On the one hand, the USSR Ministry of Power and Electrification has adopted serious measures. To cite one example, the number of installation workers of the Soyuzteploenergomontazh Association has been increased very substantially--to 2,200 persons. At the construction site they are now waving their hands in distress: there is no generator, to be more exact--its 400-ton stator; they say that the Leningrad Elektrosila Plant has let them down in this regard. Stricter and more demanding claims should be leveled against certain groups which are truly behind schedule--the enterprises Rigakhimmash, which interrupted its delivery of 10 pump-batchers, and Krasnyy kotelshchik, which has not guaranteed the shipment of five high-pressure pre-heaters. [By V. Kapelkin] [Excerpts] [Moscow TRUD in Russian 10 Jul 85 p 1] 2384

REPORT FROM KOSTROMSKAYA TETs-2--The group at Kostromskaya TETs-2 has reported on the completion of its tasks for the five-year plan. Since the beginning of the five-year plan this station has produced more than 5.5 billion kW-hours of electric power and has made savings of approximately 25,000 tons of fuel. And it would amount to a "train" of almost 500 railroad tank cars, filled with mazout [fuel oil]. [By L. Kirilenko] [Excerpts] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Jul 85 p 4] 2384

ASTRAKHANSKAYA TETs-2 IN OPERATION--The first power unit, having a capacity of 80,000 kW, has been put under a working load at the Astrakhanskaya TETs-2. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 29, Jul 85] 2384

NEW GAS PIPELINE FOR PERMSKAYA GRES--A gas pipeline has linked up the Perm-skaya GRES now under construction with the Urengoy--Tsentr-1 Mainline. In October the first unit of this electric power station will produce current on Urengoy fuel. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 29, Jul 85] 2384

SOVIET-AUSTRIAN COOPERATION IN POWER ENGINEERING--The signing of a joint protocol brought to a conclusion on 19 June in Tashkent a session of a working group on power engineering of the joint Soviet-Austrian Commission on Economic and Scientific-Technical Cooperation. Representatives from these two countries exchanged information about the status of electric-power engineering in the Soviet Union and Austria; they marked out the paths for further developing scientific, technical, and production cooperation. "Since the start of the present year practical implementation has begun on an agreement signed by the governments of our two countries regarding the mutually advantageous exchange of electric power," stated N. A. Lopatin, USSR deputy minister of power and electrification in an interview with the correspondent from UzTAG [Uzbek Telegraph Agency]. "The reason behind this measure lies in the fact that in the summertime, when the snow melts in the Alps, the surplus power from the

Austrian hydroelectric power stations is transmitted to the USSR. And in the wintertime, when the rivers are low in Austria, our thermal stations send power there. Here in Tashkent we have discussed the results of the first phase of our cooperation. Both sides expressed satisfaction with the results achieved and outlined specific tasks with regard to expanding the exchange of electric power with the involvement of other states. Implementation of the outlined program will become an important contribution to strengthening the economic, scientific, and technical cooperation between the Soviet Union and Austria. Included on the program of our guests' stay in Uzbekistan are a visit to the Charvakskaya GES, an acquaintanceship with the historical monuments and new construction projects of Tashkent and Samarkand. [Text] [Tashkent PRAVDA VOSTOKA in Russian 21 Jun 85 p 3] 2384

KRIVOROZHSKAYA GRES-2 PRODUCTION--Krivoy Rog (Dnepropetrovsk Oblast)--The figure 300 billion has been established by the adding machines of the Krivorozhskaya GRES-2. That is how many kW-hours of electric power have been produced since the station was first started up. The national economy has received more than 4 billion of this amount in excess of the plan. Renewing the equipment and using more improved methods of operating it have ensured a reduction in the expenditure of fuel. In this five-year plan alone approximately 20,000 tons of coal have been saved. [Text] [Moscow SELSKAYA ZHIZN in Russian 14 Jul 85 p 1] 2384

TURBINES FOR BEREZOVSAYA GRES-1--Turbines have begun to be manufactured ahead of schedule for the Berezovskaya GRES-1 by the group at the Leningradskaya Metallichесkiy zavod Association. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 31, Jul 85 p 4] 2384

NEW POWER LINE IN NORTHERN OSETIYA--The LEP [Electric-Power Transmission Line]-110 has been placed under an industrial load in the remote Alagir Canyon (Northern Osetiya). [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 31, Jul 85 p 4] 2384

NEW TRUCKS FOR ROGUNSKAYA GES--Tajik SSR--The construction site of the Rogunskaya GES has witness the arrival of the new BelAZ-549 dump-trucks; they came from the Belorussian Motor-Vehicle Plant in Zhodino. These heavy-duty vehicles with their enormous bodies will help the builders to speed up the construction of the station. [Excerpt] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Jul 85 p 1] 2384

EKIBASTUZ POWER EQUIPMENT AND CONSTRUCTION--Yesterday in Ekibastuz comprehensive, industrial tests were run on the custom-made, Soviet equipment of the Ekibastuzskaya-1150 Sub-Station. Carriers, reactance coils, overhead cut-out switches, (lightning) arresters, and other equipment which are most up-to-date and unique successfully passed the tests at voltages of 1,150,000--1,180,000 volts. After this, the most powerful Ekibastuz--Kokchetav a.c. electric-power transmission line is being prepared for switching on. Ekibastuz is in operation. But construction and installation operations have not ceased. Automatic compensators for the Ekibastuz--Barnaul LEP [electric-power transmission line]-1150 have already been delivered; they will connect ETEK [Ekibastuz Tractor and Electrical Equipment Plant] at first with Siberia and then with KATEK [Kuybyshev Tractor and Electrical Equipment Plant]. The poles of

this "bridge" are already marching through the Kulunda Steppe. And nearby the Ekibastuz--Central Industrial Region D.C. Transformer Sub-Station is waiting for builders. Construction of super-powered electric-power mainlines in the eastern part of the country has entered upon its decisive phase. [By V. Stupak, corres., Ekibastuz] [Excerpts] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 28 Jul 85 p 3] 2384

TURKSIB RAILROAD ELECTRIFICATION--Electrification of the legendary Turksib has begun. An electric locomotive has hauled the first heavyweight train over the 125-kilometer Mointy--Saryshagan Section. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 28, Jul 85 p 3]

POWER LINE FOR KASHINSK CANAL--The 220-kV electric-power line in the south of Kashkadairinsk Oblast has been placed under industrial load. When it was put into operation, a reliable electric-power supply was received by all six pumping stations of the cascade of the Karshinsk Mainline Canal--the principal water artery in this steppe zone of Uzbekistan. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 28, Jul 85 p 3] 2384

SAYANO-SHUSHENSKAYA GES NEARING COMPLETION--Upon the initiative of Lenin-grad's enterprises and organizations taking part in the construction of the Sayano-Shushenskaya GES, a broad-based socialist competition has been launched for reducing the time periods required and for a high quality of operations in building this hydroelectric power station. Thanks to the efforts of hundreds of labor groups, construction of this hydro complex is nearing completion. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 28, Jul 85 p 5] 2384

PROGRESS AT KUREYKA GES--Svetlogorsk (Krasnoyarsk Kray)--An important event has occurred in the construction of the GES on the Kureyka River beyond the Arctic Circle--the closing off of this willfully capricious river took place a month ahead of the projected deadline. Taking part in this operation were 50 heavy-duty dump trucks, and the right to be first in dumping rocky soil into the swirling abyss was obtained by the construction site veteran, Brigade-Leader V. Bezgin. [By P. Zinkeyev] [Text] [Moscow SELSKAYA ZHIZN in Russian 26 Jul 85 p 1] 2384

SAVINGS AT SAYANO-SHUSHENSKAYA GES--Ten years ago we witnessed the birth of an initiative--approved subsequently by the CPSU Central Committee--of Lenin-grad's labour groups regarding scientific and technical cooperation with the builders of the Sayano-Shushenskaya GES. The agreement on cooperation unites more than 250 participants. By their joint efforts they have succeeded in saving a considerable amount of material and technical resources, as well as putting heavy-duty hydroelectric units into operation. The specialists have computed that the cement, reinforcement metal, and other materials saved as a result of applying progressive engineering and planning solutions are fully sufficient for constructing the second station of the Sayano Hydroelectric Complex--the Maynskaya GES. Today its construction is moving at full speed ahead. [Text] [Moscow EKONOMICHESKAYA GAZETA no 28, Jul 85 p 5] 2384

PROGRESS AT SHAMKHORSKAYA GES--After repairs were successfully carried out, the first turbine of the Shamkhorskaya GES is again producing power. During the course of operations the brigades of Mira Mirkhasyyev and Ravil Kasumov

modernized in accordance with a schematic developed by them, one of the important assemblies of this unit--the lubrication system. Due to this, there has been a reduction in the expenditure of material, and, moreover, the unit is now operating on an optimal schedule. This year a noteworthy event occurred at the station: the 1.5 billion mark was reached in its production of kW-hours of electric power since the day it was started up. This station, in discharging its peak load, is playing an important role in improving the supply of electric power to the industry and agriculture of the republic's western zone, and it is facilitating the development of this region's economy. The power engineers have achieved an economical expenditure of water during the production of electric power; due to this, the water level in the Shamkhor "Sea" is constantly rising and is approaching the planned mark. By the time the 27th CPSU Congress opens, the people here intend to reach the following two important milestones: production of the 2 billionth kW-hour of electric power and the accumulation in the "sea" of the planned amount of water--2.75 million cubic meters. [Excerpts] [Baku VYSHKA in Russian 21 Jul 85 p 1]  
[Azerinform, Shamkhor] 2384

REPAIR PROBLEMS AT EKIBASTUZSKAYA GRES-1--The lack of a solid repair center is one of the main causes for equipment frequently getting out of order at Eki-bastuzskaya GRES-1. In order to service this as well as subsequent stations of the TEK [tractor and electrical equipment plant], a central repair and mechanical plant is under construction. The estimated cost of the production wing alone amounts to 12.3 million rubles. This construction project has already been under way for several years. And during all this time the Ekibastuzenergostroy Trust has completed construction-and-installation work amounting to merely 1.7 million rubles. Only 30,000 rubles have been spent on the production wing. Matters are proceeding slowly on the warehouse section, even though the equipment for the plant has already arrived. During the current year the Promstroy General Contracting Administration is meant to carry out 3.2 million rubles worth of construction-and-installation work on this project. But during the past three months absolutely nothing has been accomplished here. And so far housing has not been built for the workers and specialists of the future plant. It has been planned to introduce apartment houses with a total area of 99,000 square meters, as well as facilities for social and everyday purposes. However, matters have not gone beyond the stage of working out plans. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 28, Jul 85 p 9] 2384

PLANS FOR TURUKHANSKAYA GES--The Scientific and Technical Council has examined the groundwork presented by the Gidroproyekt Institute imeni S. Ya. Zhuk for the construction of the Turukhanskaya GES on the Lower Tunguska River. The rated capacity of this GES in its first phase will be 12 million kW with the possibility of expanding its development subsequently; the average annual production of electric power will exceed 40 billion kW-hours. Hydro units with a capacity of 1.0 million kW each will be installed at this GES. The power-engineering efficiency of the Turukhanskaya GES is characterized by the following data: the pay-off period will be 5--8 years, and the cost of producing electric power will be about 0.16 kopecks (per kW-hour). The Scientific and Technical Council noted that the Turukhanskaya GES in its potentials and parameters constitutes a unique project of power engineering and will be the largest in the USSR and one of the largest in the world. [Text] [Moscow ENERGETIK in Russian No 7, Jul 85 p 39] [COPYRIGHT: Energoatomizdat, "Energetik", 1985] 2384

ENERGY CONSERVATION

GAS INDUSTRY MINISTER DISCUSSES INDUSTRIAL CONSERVATION PLANS

Moscow PRAVDA in Russian 28 Aug 85 p 2

[Article by V. Chernomyrdin, USSR Minister of Gas Industry: "Guarding the River of Gas"]

[Text] The country's gas industry is making a meaningful contribution to successful implementation of the USSR Energy Program. Fulfillment of plan tasks and socialist commitments for gas recovery and for other basic technical and economic indicators during 4½ years of the 11th Five-Year Plan period was completed ahead of schedule. More than 40 billion cubic meters of gas were obtained above the five-year plan goal. New socialist commitments for this year were adopted in honor of the 27th CPSU Congress.

The 26th CPSU Congress's decisions called for gas recovery to be brought up to 600-640 billion cubic meters in 1985. Right now our efforts are aimed at achieving the upper level for recovery. The industry's work results since the start of the year inspire confidence that this goal will be reached.

But nevertheless, the problem of providing the national economy with a reliable and stable gas supply remains extremely pressing. The CPSU Central Committee paid special attention at the June meeting on problems of accelerating scientific and technical programs to the necessity for a zealous attitude toward material resources--one of the main reserves for intensifying social production. In considering the large and growing volume of gas consumption and the vast material, equipment, financial and labor expenditures connected with recovering gas and delivering it from remote regions, concern about its rational and economic use are among the most important problems.

Our industry, in recovering gas on a broad scale, is itself one of the large consumers of gas. Therefore, special attention is being paid to the economical consumption of gas at our enterprises. A comprehensive plan of scientific, technical and organizational measures aimed at reducing gas consumption for operating needs and at reducing losses during gas recovery, treatment and transport has been developed and is being implemented. Thanks to modern equipment, the operating modes of the USSR Unified Gas Supply System are being optimized, and work is being done to raise the hydraulic effectiveness of the gas pipelines' linear portions.

More economical gas pumping units are being used at the compressor stations that are under construction, and existing stations are being rebuilt and their obsolete gas-pumping units replaced. Norms for fuel and power resources consumption are being improved.

Further work to reduce gas consumption at the industry's enterprises will be based on the introduction of progressive energy-saving operating processes and equipment. The 12th Five-Year Plan intends that we create, jointly with machinebuilding ministries, a new class of automated gas-turbine units that will enable specific fuel-gas consumption to be reduced by 12 percent, compressor installations that work on a gas-and-steam cycle, and electric-drive gas-pumping units of increased unit capacity. Equipment that provides for more complete extraction of heavy hydrocarbons and other accompanying components from the gas will be created.

One of the important ways for saving gas is more complete utilization of the secondary heat resources of compressor stations. The operating areas of these stations and settlements and greenhouses are being heated through the use of this heat. Compressor stations and gas-treatment plants are now being equipped with systems for using exhaust-gas heat, enabling no little secondary heat to be used annually. However, the industry is not in a position to consume all the existing secondary-energy resources for in-house needs. The problem is already becoming one of an interindustry nature. It is planned to erect during the 12th Five-Year Plan period, alongside the compressor stations, vegetable combines for USSR Minplodoovoshchkhоз [Ministry of Fruit and Vegetable Industry], RSFSR Minselkhoz [Ministry of Agriculture] and other ministries. It is regretted that this work is proceeding slowly.

The ministry is monitoring gas consumption in all branches of the economy. But much remains to be done here. Checks conducted by state gas inspection organs indicate that total nonproductive gas consumption reaches 6 percent of annual gas consumption at the industrial enterprises of some ministries and agencies.

For example, gas is used wastefully at the Balakleya Cement Roofing-Shingle Combine of USSR Minstroymaterialov [Ministry of Construction Materials Industry], the Moscow Car-Repair Plant imeni V. Voytovich of the Ministry of Railways, the Rostov Chemical Production Association imeni Oktyabrskaya Revolyutsiya of Minkhimprom [Ministry of Chemical Industry] and the Donetskvtortsvetmet [Donetsk Production Association for the Processing of Secondary Nonferrous Metals] of USSR Mintsvetmet [Ministry of Nonferrous Metallurgy].

In order to eliminate the causes of wasteful gas consumption, primarily correct organization of the operation of the gas-using equipment, equipping the units with economical gas-burning devices and with heat-recovery boilers, and automated regulation of combustion processes are required.

A prerequisite to the economical consumption of fuel and power resources is the unit-by-unit and plantwide recording of fuel consumption. Two thousand seven hundred enterprises of various ministries and agencies were checked. What was found? At almost half of them, it proved to be impossible to determine actual savings of fuel and heat. Meanwhile, these enterprises regularly reported the fulfillment of goals for savings.

Indeed much gas can be saved with a concerned, economical attitude toward the use of gas. In particular, the example of such enterprises as the Novo-cherkassy Synthetic Products Plant, the Kuybyshev Metallurgical Plant and the Kirovabad Aluminum Plant imeni 50-Letiya SSSR testify to this.

In our opinion, funds for those ministries, agencies and enterprises that do not adopt the necessary measures for imposing proper order in gas consumption should be reduced. And, on the contrary, every incentive should be given to enterprises where real gas savings are achieved systematically.

An important factor in economical gas consumption is strict observance of consumption discipline by all enterprises without exception. An increase in gas consumption above the established daily ceilings by some consumers leads to serious complications in the gas supply of others. This happens especially frequently during the winter cold season, when the use of gas for heating buildings doubles. Increased demand for gas by municipal and domestic services and the populace should be provided by converting industrial enterprises and electric-power stations to reserve types of fuel.

Meanwhile, in some parts of the country, above-ceiling withdrawals of gas are permitted, even in the summer. Managers of enterprises thereby cover up their own economic negligence at someone else's expense. It is to be hoped that local party and soviet organs will strengthen monitoring of observance of the strictest practices for gas consumption and for saving gas everywhere.

Gasworkers, together with the collectives of large enterprises of a number of industries, have made up comprehensive special-purpose programs for saving gas. Eventually it will be desirable to develop such programs throughout all branches of the economy.

The country right now is widely promoting work on preparation for the coming winter. The industry is intensively pumping gas into underground storage, the planned preventive maintenance is being performed on schedule, materials and reactants necessary for winter operation are being received, and housing and facilities for social, cultural and domestic services purposes are being made ready. Special attention is being paid to those regions where difficulties in gas supply for various consumers have occurred--the North Caucasus, the Ukraine's south, and other places.

Timely introduction of capacity and buildup in the amount of Tyumen gas recovered and delivered to the country's central region determine the reliability of gas supply to a great extent. However, at some facilities a delay has been noted. In particular, the buildup of the Urengoy field and the construction of compressor stations on Urengoy-Central Economic Region gas pipeline No 2 have been prolonged. We, jointly with the contracting organizations, must take energetic measures to speed up operations on the erection of these facilities by the deadlines.

Enterprises of all ministries and agencies are obligated to prepare the fuel and power activity well for operation under winter conditions and to accumulate reserves of standby fuel in timely fashion. However, not everywhere is the attitude toward this important matter one of due responsibility. At the start of the second half, 276 of the 2,260 enterprises checked did

not have reserve fuel, and 884 enterprises had not even allocated funds for the second half of the year. A less than normal situation with regard to reserves of standby fuel has existed at enterprises of Uzbekistan, Turkmenia, and Kazakhstan and Leningrad, Rostov and Dnepropetrovsk and some other oblasts. Obviously, not all supervisors of industrial enterprises have learned the instructive lessons of the last severe winter.

For the 12th Five-Year Plan period, our ministry has worked out a broad integrated program for further intensification of production and for raising its effectiveness, based upon the introduction of the modern achievements of science and technology. This programs calls for a buildup in the recovery of gas, gas condensate and crude and a deepening of the integrated treatment of hydrocarbon raw materials, with a great increase in the output of sulfur, ethane, helium, liquefied gases and other valuable products. Successful realization of the planned program will enable all the industry's operating indicators to be improved considerably.

We have at our disposal no few reserves for rational and economical consumption of gas. Involving them in the turnover and waging a decisive struggle against wastefulness of "blue gold" are the patriotic duties and a significant matter for all working collectives.

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ENERGY CONSERVATION

IRKUTSK REGION REPORTS FUEL ECONOMIES, MODERNIZATION PROBLEMS

Moscow EKONOMICHESKAYA GAZETA in Russian No 35, Aug 85 p 10

[Article by V.Nerodov, director, Siberian affiliate of the VNIPPIenergoprom institute: "How the Program "Energy" is Being Implemented"]

[Text] The Angara region, like a number of other oblasts in the country, is currently implementing a special comprehensive program aimed at conserving fuel and energy resources over the period from 1981 to 1985. The program's target for the five-year span is to achieve a savings of 1.3 million tons of fuel, 2.4 billion kilowatt/hours of electricity and 4.5 million gigacalories of heat, which is equivalent to 2.8 million tons of standard fuel overall.

How is the program progressing? The four-year assignment for fuel and energy conservation was fulfilled and overfulfilled by 18 associations and enterprises. Among these are the East Siberian railroad, the Irkutsk and Bratsk aluminum works, the East Siberian ceramics plant, the Cherekhovo cardboard and rubberoid factory, the production association "Angarsknefteorgsintez", the Bratsk heating appliances plant.

The amount of fuel conserved was 0.7 million tons, electricity - 2 billion kilowatt hours, heat - 2.4 million gigacalories. This is equivalent to 1.7 million tons of standard fuel, or 92 percent of the assignment for the four years.

A breakdown into categories of the measures carried out reveals the following picture: incorporation into production of new technologies and equipment made for a savings of 309 thousand tons of standard fuel or 86 percent of the "Energy" program's target figure, improvements in existing technological processes and modernization of equipment - 511 thousand tons of standard fuel or 68 percent. On the other hand, organizational and technical measures and utilization of low-potential heat conserved 570 thousand tons of standard fuel or 130 percent of the assignment.

As evidenced by these figures, measures which are aimed at absorbing the achievements of scientific and technological progress and which

constitute the backbone of high conservation levels in the long-range perspective have fallen behind schedule. This is a cause for concern.

Of the 13 major associations in the oblast that account for most of the conserved fuel and energy resources only the East Siberian railroad, the Bratsk and Irkutsk aluminum works succeeded in absorbing resource-efficient machinery and technology in the volumes envisioned by the program for 1981-1984. The railroadmen now successfully use recuperative braking, run extra-heavy trains, are implementing on a broad scale the projects and recommendations of science. The Bratsk aluminum plant is modernizing its electrolyzers, optimizing its technological processes and improving the quality of its anode mass.

The reasons behind the lag in the implementation of measures that fall into the category of scientific and technological progress deserve special attention. They are typical of many associations and enterprises and should be taken into consideration in drawing up a list of conservation measures for the twelfth five-year plan.

We have in mind the insufficiently active pursuit of technical retooling, modernization and reconstruction of plants. The "Angarsknefteorgsintez" association, for example, failed in its bid for a 2 million ruble allotment to build a tipper to mechanize the offloading of concentrates which would have ensured an annual conservation of 1.1 million kilowatt hours of electricity. A delay of three years in commissioning an automatic control system here (ASU) resulted in the non-conservation of 21 million kilowatt hours of electricity.

Because of inadequate funding by the USSR Ministry of Power and Electrification of the development of new thermosources and thermo-systems by the Regional Power Administration "Irkutenergo" the oblast has many electric boiler houses in operation. The installed capacity of the electric boilers that today function in Irkutsk is roughly equal to that of the Irkutsk hydroelectric power station. In addition to the overexpenditure of coal, their continued operation in Irkutsk, Bratsk and Ust-Ilimsk is holding up the introduction of electric heating into the oblast's agriculture.

A number of the program's measures in the area of technical retooling, absorption of new technologies and utilization of secondary resources are not being implemented because of the refusal by construction organizations to incorporate these projects into their plans while client enterprises do not have the capability to do the work on their own.

It is for this very reason that the "Angarsknefteorgsintez" association has not changed its process for the production of technological gas or reconstructed its polystyrene-producing facility

and has fallen behind schedule in the commissioning of a utilizer boiler to burn the gas that today is senslessly torched. As a result, 9.8 million kilowatt hours of electricity and six thousand gigacalories of heat were not conserved

Measures are currently being worked out in the framework of the "energy" program aimed at economizing fuel and energy resources over the impending five-year period. Recommendations have been drawn up and sent out to all the enterprises in the oblast. Methodological supervision is exercised by a special scientific-research group.

However, it would be incorrect to say that work on these programs is going well everywhere. Over 30 associations and enterprises have not presented their draft programs while most of the programs already need a good deal of revision in the major aspects of fuel and energy conservation.

Some associations and enterprises have enlisted the services of a wide range of scientific research institutes and project design organizations, as well as all their own subdivisions, to work on their fuel and energy conservation programs. Among these are the association "Angarsknefteorgsintez", the Irkutsk and Bratsk aluminum works, the Angarsk electromechanical works, the Ust-Ilim industrial lumber complex. At other associations and enterprises, though, work on the programs has been assigned to the subdivisions under the chief energy engineer with no participation by any technological subdivisions at all. The guilty parties include the Glavvostoksibstroy MA of the USSR Ministry of Construction in the Far East and Transbaykal Regions, the Irkutsk imeni Kuybyshev heavy machine building plant of the USSR Ministry of Heavy and Transport Machine Building and a number of others. Needless to say, such an approach substantially lowers the technical level of the measures adopted and diminishes the scope of the quest for reserves in the matter of fuel and energy conservation.

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ENERGY CONSERVATION

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GROWTH OF ENERGY DEMAND IN RESIDENTIAL HOUSING SECTOR

Moscow ZHILISHCHNOYE I KOMMUNALNOYE KHOZYAYSTVO in Russian No 8,  
Aug 85 pp 39-40

[Article by M.V.Tarnizhevskiy, deputy director, Academy of Municipal Services imeni K.D.Pamfilov: "Energy Conservation: New Solutions"]

[Excerpts] Housing and municipal services consume up to 30 percent of the thermal energy and up to 12 percent of the electricity produced in the country. What's more, all the signs point to a further increase in these figures due to continuing construction of housing and cultural and personal-services buildings.

The most energy-intensive consumers are housing (including buildings that serve a public function), water-supply and sewage plants and urban electric transport.

The consumption of electricity by housing and municipal services is constantly on the rise. Thus, in 1975 this sector used 89.2 billion kilowatt hours, in 1980 - 155 billion and in 1985 consumption will total 191 billion kilowatt hours. 35 percent of that amount is used by the population, 65 percent - by municipal services and public buildings. Of the overall consumption by the municipal services almost 50 percent is consumed by lighting appliances and external lighting, about 15 percent by water-supply and sewage plants and 6 percent by city electric transport.

Systematic work is conducted on the local level to conserve electricity in its transmission and consumption phases alike. The measures involved fall into three categories: organizational measures directed at stimulating efforts to cut down on all unproductive expenditures of electricity; modernization of existing equipment, modification of its parameters; installation of new, less energy-intensive machinery, automatic regulation and control of its work modes.

At the present time conservation of electricity takes place chiefly in the first two categories. Thus, when the waterworks in Vyborg, Kirishi (Leningrad oblast) and Salavat (Bashkir ASSR) were placed under a new system of performance evaluation a number of organizational and technical measures to reduce water loss were implemented

there. These alone resulted in a drop of 10 percent in water expenditure. If adopted by all the water-supply plants in the RSFSR this system would allow the conservation of 700 million kilowatt hours of electricity a year.

In 1982-1984 work on the operational optimization of urban grids achieved substantial proportions. The use of computer technology allowed the optimization process to tackle a wider range of problems which in 1983 led to a reduction of losses in the grid and the conservation of 32 million kilowatt hours of electricity.

Increasing grid capacity with a simultaneous increase in distributor grid voltage from 6 to 10 kilovolts ensures a reduction in losses of electric energy of no less than 10 percent.

The substantial expenditure of electricity for illumination lends particular importance to measures aimed at its conservation in residential and public buildings as well as in external lighting installations. Broadly speaking, these measures can be divided into three groups: using more efficient light sources and optimal lamp design; switching to rationally designed installations; regulating the workmode of lighting installations by means of preset programs or automatic regulation thereof.

The first group is characterized by such measures as switching to high-pressure gas-discharge lamps instead of luminescent or incandescent lamps. So far this is being done only with external lighting installations. Replacing DRL lamps (80-700 volts) or incandescent lamps (200-300 volts) in lighting fixtures with high-pressure sodium lamps (DNaT) of 50-400 volts yields an annual economy of 200-300 kilowatt hours per fixture.

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GENERAL

FUEL-ENERGY USE EFFICIENCY STUDIED

Moscow VESTNIK STATISTIKI in Russian No 9, Sep 85 (signed to press 22 Aug 85)  
pp 11-18

[Article by V. Proskuryakov, doctor of economic sciences, professor, prorector of MESI [Moscow Institute of Economics Statistics], and R. Samulyavichyus, candidate of economic sciences, Vilnius State University, under the rubric "Statistics Theory and Practice": "Set of Indicators of the Use Efficiency of Fuel-Energy Resources"]

[Text] Rational use of physical resources and their most important components represents one of the principal directions for improving the efficiency of social production. Fuel-energy resources (TER) are the basis of the development of industrial production, and an improvement in their use efficiency is becoming one of the principal sources for covering the additional need for them. The problem presently is to satisfy by 75-80 percent the increased need of the national economy for fuel, raw materials and basic supplies through their economy.

The planning and rational use of fuel-energy resources depend considerably on the development of an appropriate set of statistical indicators based on general methodological principles for evaluating the efficiency of all social production.

The minimization of social outlays connected with the use of these resources in all stages of their reproduction for attaining full assurance of given development rates of the national economy can be taken as a criterion of the economic efficiency of fuel-energy resource usage. This criterion is fundamental in evaluating the efficiency of fuel-energy resource use in all hierarchical levels of the national economy from the enterprise to individual regions. It is expressed in real physical form as the economy of resources at all stages of their reproduction. In the production stage economy is taken to mean a reduction in the level of resource losses during their successive conversion, beginning with the production of natural fuel-energy resources up to their final volume supplied to customers for the production of nonenergy products; in the circulation stage it is taken to mean a reduction of resource losses in the process of getting them to the ultimate consumers (over pipelines, by rail and motor transport, over power distribution networks); and in the final consumption stage it is taken to mean a reduction in specific consumption in the production of nonenergy products.

All social outlays connected with use of fuel-energy resources must be reflected in the generalizing indicator on the basis of the stated criterion. The output volume of nonenergy products can be taken as the result of the use of fuel-energy resources. The end results of fuel-energy resource use presume that the stages of their production and circulation are considered as intermediate stages. K. Marx wrote: "Raw material has to . . . go through a large number of various processes in which it again functions each time as raw material in a constantly changing form right up until the final labor process, from which it now emerges as a finished means of life or a finished means of labor."<sup>1</sup>

In this connection the efficiency of outlays involving the use of fuel-energy resources in their production stages--production of natural fuel-energy resources, processing, generation into electrical and thermal energy--should be considered as factors in realizing the criterion and changing its generalizing indicator.

The generalizing indicator of the efficiency of all outlays for the use of fuel-energy resources can be depicted in the following form:

$$\frac{\sum_{i,j} \vartheta_i \cdot y_{ij} z_j}{Q_k} = \frac{\sum_{i,j} \vartheta_i \cdot z_j / \vartheta_i + z_k}{Q_k},$$

where  $i$ --kinds of fuel-energy resources (fuel, possibly separated into types; electrical and thermal energy);  
 $j$ --producers of fuel-energy resources (regions and power systems, or fuel and energy sectors, or specific producing enterprises);  
 $z$ --end consumers (physical production of the entire country or of individual regions or its individual nonenergy sectors or enterprises);  
 $\vartheta_n, \vartheta_k$ --the volume of the  $i$ -th type of fuel-energy resource produced and delivered respectively to the end  $z$  consumers for production needs from  $j$  producers in tut (tons of standard fuel) or in corresponding units of measurement (tons, kilowatt-hours, gigacalories);  
 $y_{ij}$ --specific general outlays for producing the  $i$ -th type of fuel-energy resource for the  $j$  producers, delivered to  $z$  end consumers, also including the end consumers' own production of fuel-energy resources, in rubles per ton of standard fuel or rubles per kilowatt-hour or rubles per gigacalorie;  
 $z_n$ --general outlays connected with the production of fuel-energy resources delivered to end consumers, in rubles;  
 $z_k$ --transport costs for bringing and distributing fuel-energy resources from producers to their end consumers, as well as outlays directly connected with end consumption of fuel-energy resources (with the operation and improvement of energy equipment for transfer, measurement, regulation, switching on and off, and so on), in rubles;  
 $Q_k$ --gross or net product of nonenergy sectors of physical production, in rubles.

The indicator permits avoiding a duplication of outlays in the subsequent conversion of fuel-energy resources along the entire chain of successive stages of their production and makes it possible, with appropriate information available,

1. K. Marx and F. Engels, "Sochineniya" [Works], Vol 23, p 193.

to determine the given indicator at all levels of the national economy. It provides an opportunity, depending on the selected subject of study and information available, to select various combinations of  $i$ ,  $j$ , and  $z$  from their given values in the actual calculation.

All social outlays for the production and transport of fuel-energy resources (both produced in a given region and produced outside such region) which have come for end production consumption must be taken into account in computing the stated generalizing indicator at the level of individual regions or republics under conditions of the national unified fuel-energy complex which has been formed. This makes it possible to comprehensively assess resource use efficiency and determine the real saving obtained as a result of this.

Also included in the stated indicator in computing specific outlays  $Y3_n$  and  $3_n$  is the cost of the fuel-energy resources which have arrived at their final stage of production from preceding stages, in consumption prices, and transport costs. Taking into account the specific nature of the pricing of fuel-energy resources, these prices reflect social costs of their production in previous stages. For this reason the  $Y3_n$  factors reflect not only the efficiency of outlays of the final volume of fuel-energy resources arriving for final consumption, but also the efficiency of outlays for the entire chain of their conversion which precedes this stage. We should take note of instances where fuel-energy resources arrive for final consumption immediately on being produced and their cost is determined only by social costs in this stage.

The  $Y3_n$  indicator acts as a generalizing indicator, taking into account the exceptional uniformity of the real-physical composition of cost indicators of the products of fuel and electrical power sectors. For a complete characterization of the efficiency of outlays for the production of fuel-energy resources it is necessary to construct an entire set of indicators of specific outlays along their entire conversion chain, which makes it possible to reveal the entire cost formation mechanisms of fuel-energy resources entering final consumption.

Included in the proposed generalizing indicator in addition to the efficiency of aforementioned outlays are outlays connected with getting (transferring) fuel-energy resources to the final consumers, and outlays directly connected with the organization of final consumption of fuel-energy resources ( $3_k$ ). A number of particular indicators characterizing the efficiency of these outlays and promoting fuel-energy resource economy in the stages of circulation and final consumption can be placed in a separate group. This article does not examine the problems of measuring efficiency and separating out in general the outlays for final consumption of fuel-energy resources among the outlays for equipment upkeep and operation and the comprehensive items for calculating production cost. It is important only to note that they supplement the outlays for fuel-energy resource use in the production and circulation stages and, together with them, make up the overall cumulative outlays directly connected with use of fuel-energy resources in their entire reproduction cycle. In addition, these outlays for final consumption, especially concerning an improvement in the power facilities of final consumers, promote the economy of the physical volume of fuel-energy resources and thus act as one of the principal factors in reducing the indicators of product energy resource-intensiveness.

It is also advisable to consider one-time outlays for the production of fuel-energy resources in addition to current outlays in all the indicators mentioned. The one-time outlays make up a significant portion of all aggregate social outlays for production of fuel-energy resources. Each year approximately one-third of all capital investments of industry goes into the national fuel-energy complex (TEK). Reduced outlays per unit of produced fuel-energy resources along their entire conversion chain can act as indicators of aggregate specific outlays. These indicators can be calculated for the year from a generally accepted formula, using standardized coefficients of capital investments:  $C_{ijz} + E_H K_{ijz}$ , where  $C_{ijz}$  and  $K_{ijz}$  are specific current and capital outlays respectively per unit of the  $i$ -th type of fuel-energy resources produced by  $j$  producers and going to  $z$  consumers. Bearing in mind the conditional nature of using the coefficient  $E_H$  for comparing current and one-time outlays (for example, its lack of consideration of the difference in time of assimilation of the capital investments, their mutual dependence on current outlays, and so on), we should also construct a set of direct indicators of the specific capital-intensiveness of a unit increase in separate types of fuel-energy resources produced along their entire conversion chain to the final volume, also including in this set the circulation stage of fuel-energy resources (capital-intensiveness of the transport and transfer of fuel-energy resources), as well as indicators of the efficiency of capital outlays for improving the power facilities of final consumers for the purpose of fuel-energy resource economy. Corresponding lags of capital investments also should be selected in constructing all the indicators mentioned.

In the final account the aforementioned indicators in the aggregate determine the change in prices<sup>2</sup> on energy resources acquired by their final consumers. And they thus largely determine the value of cost indicators of the energy resource-intensiveness of products, which can be depicted in the following form:

$$\sum_{ijz} \varTheta_k \cdot P/Q_k = \sum_z \varTheta_k(P)/Q_k,$$

where  $i, j, z, \varTheta_k, Q_k$  -- mean the very same as in the previously given generalizing indicator;  
 $P$  -- are prices on the consumption of resources, also including transport costs;  
 $\varTheta_k(P)$  -- value of consumed fuel-energy resources.

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2. In addition to accounting for social outlays, prices on fuel-energy resources also perform a certain stimulating and regulating function in the consumption of individual types. For example, in view of the limited nature of natural fuel-energy resources the use of their less efficient types is encouraged, tariffs on electrical energy depend on the characteristics of its consumption during a 24-hour period, and by virtue of the low electrical energy production cost the tariffs themselves also include a turnover tax. Therefore these indicators characterize the efficiency of final consumption of fuel-energy resources to a greater extent while at the same time being an expression, to a certain extent, of the global criterion of their usage efficiency.

The energy resource-intensiveness indicator acts as the leading indicator in the group of resource consumption efficiency indicators, since it stems directly from the previously given generalizing indicator of their usage efficiency.

The direct coefficients of outlays for fuel-energy resources in intersectorial product production and distribution balances (MOB) are similar to the indicators given according to the principle of determining their numerator. Under the existing methodology for compiling the MOB these coefficients are calculated as the ratio of cost in consumer prices of all and individual types of fuel-energy resources coming from electrical power and fuel sectors for the production of specialized products to the gross production volume of other net sectors. The coefficients of direct outlays for fuel-energy resources characterize the technological ties between production and consumption, which corresponds to the structure of the given generalizing indicator.

The computation of coefficients of direct outlays for fuel-energy resources in net sectors also predetermines their differences in comparison with the given product energy resource-intensiveness cost indicators. Taking into account that the list of net and economic sectors coincides, both of these indicators make up for each other and together they give a comprehensive description of the efficiency of outlays for fuel-energy resources.

As with the cost indicators of product energy resource-intensiveness, the direct outlay coefficient can be determined on the basis of forms for simultaneous accounting of outlays for production at all levels of the national economy.

In addition to the value factor, the indicators of the efficiency of consumption of the physical volume of fuel and energy resources predetermine the value of indicators given above. Such indicators are the real-value ( $\mathfrak{R}_k/Q_k$ ) and the real ( $\mathfrak{R}_k/q_k$ ) indicators of specific outlays of all fuel-energy resources (in standard measurement units) or their individual types (in standard or corresponding measurement units) figured per unit of product in the value ( $Q_k$ ) or the real ( $q_k$ ) measurement.

The basic problem in determining the composite real-value indicators of product energy resource-intensiveness is converting the volume of different types of resources into a common measurer. For fuel it is generally accepted to transfer its individual types into tons of standard fuel (tut) according to their calorific power. The correctness of this also is confirmed by the fact that outlays for the production of coal used in producing electrical power are the basis for prices on individual types of fuel. But the prices on oil, natural gas, peat and other fuel are based on the level of prices on coal and on the correlation of the calorific power of these types. Consideration of the problems of transferring electrical and thermal energy into standard fuel tons requires a different approach. While the production and consumption of these types of fuel and energy resources are considered a single whole within the framework of the national fuel-energy complex, it is advisable to recalculate the volume of consumed electrical and thermal energy into standard fuel tons based on the corresponding average specific outlays of fuels of all types in

standard fuel tons for their production in thermal electric power stations and all types of boiler rooms. Such a recalculation of electrical and thermal energy is recommended for use in determining the overall economy of all types of fuel and energy resources. But if we examine these recalculation problems in the context of the stated generalizing and specific value indicators of resource use efficiency, then in order to achieve comparability in them between outlays for use of fuel-energy resources in all succeeding use stages and their produced or consumed volume it is necessary to compare all types of fuel-energy resources in the final consumption stage in standard fuel tons for calorific power, i.e., for the physical equivalent, since the outlays and corresponding produced volume of fuel-energy resources in the conversion processes already have been considered in the stages preceding final consumption. Otherwise, in determining the value expression of the obtained economy of electrical and thermal energy in recalculation, as suggested, to the primary, initial fuel expended for their production, it is possible (and it would be correct) only to take account of corresponding outlays for its production. Moreover, the question remains open as to the rightfulness of recalculating the volume of saved electrical and thermal energy produced at the atomic electric power stations and the hydroelectric power station into standard fuel tons in a similar manner.

With regard for all that has been said it can be concluded that all types of final consumption must be recalculated into a common measurer such as in standard fuel tons based on their calorific power in constructing composite real-value indicators of fuel-energy resource efficiency and in subsequently determining their change in resulting economy both of social outlays and of the physical volume of fuel-energy resources.

The physical volume of fuel-energy resources taken into account in constructing the value, the real-value and the real indicators of product energy resource-intensiveness is formed from a successive conversion of fuel-energy resources in their production stages. This process can be described by a set of indicators of specific consumptions of certain types of fuel-energy resources for the production of other types. A uniformity thus is achieved between the value and real-physical forms of the volume of fuel-energy resources ( $\Theta_k$ ) entering final consumption. Meanwhile, the indicators of specific consumptions of certain types of fuel-energy resources for the production of other types act as natural indicators of fuel-energy resource use efficiency and determine the economy in their production stage. Together with the real-value and the real indicators of the energy resource-intensiveness of nonenergy products, they make up a common set of indicators of the efficiency of use of the physical volume of natural and converted types of fuel-energy resources for their entire reproduction cycle.

It is important to note that it is of course possible to recalculate the consumed volume of fuel-energy resources in energy resource-intensiveness indicators into the primary natural resources based on availability of appropriate information needed for constructing indicators of specific outlays of certain types of fuel-energy resources for the production of other types. The indicators of product energy resource-intensiveness calculated for the primary natural fuel-energy resources can be used to balance the production volumes of

natural fuel-energy resources with their final consumption in a converted form, and also to calculate the saving of natural fuel-energy resources as a result of more effective consumption.

In view of differences in the nature of consumption of individual types of fuel-energy resources the value, real-value and real indicators of product energy resource-intensiveness calculated for the entire volume of consumed fuel-energy resources should be supplemented with a number of particular indicators of product energy resource-intensiveness calculated for individual types of fuel-energy resources: indicators of product fuel-intensiveness, with the discrimination of specific types of fuel and of product electrical-intensiveness and thermal-intensiveness. The indicators of specific outlays of fuel used as primary and secondary materials and as energy carriers for propellant and thermal processes (without its preliminary conversion into electrical and thermal energy) must be distinguished among the indicators of product fuel-intensiveness.

Indicators of specific electrical energy outlays for the principal directions of its consumptions (for propellant processes, industrial needs, illumination, and other production needs) should be distinguished among the indicators of product electrical-intensiveness.

A more detailed accounting of differences in the nature of fuel-energy resource usage in evaluating the efficiency of their consumption is possible by constructing indicators of product fuel-, electrical- and thermal-intensiveness in the cross-section of directions for consumption of fuel-energy resources distinguished in drawing up fuel-energy balances: consumptions of fuel-energy in industrial and heating furnaces, apparatus and other technological units; consumptions in power engines which directly activate working machines, mechanisms and various transport resources, hoisting and transport equipment, and agricultural machinery; fuel and energy consumption in energy-consuming production processes (actuator, electrophysical and electrochemical processes); medium- and high-temperature processes, low-temperature processes, and illumination.

It must be noted that in constructing the particular real-value indicators of product energy resource-intensiveness in the cross-section of all aforementioned directions for consumption of fuel-energy resources we have to consider the very same product volume (gross or net) as in constructing the generalizing indicators of product energy resource-intensiveness for all consumed fuel-energy resources. The sum of the volumes of fuel-energy resources considered in constructing these particular indicators must equal the volume of all fuel-energy resources used in computing the generalizing indicators of product energy resource-intensiveness. Precise functional ties thus are obtained between the particular and generalizing indicators of product energy resource-intensiveness.

With regard to the real indicators of product energy resource-intensiveness, they are figured as specific outlays of specific types of fuel-energy resources per unit of the most important types of products in real measurement according to their list given in Form No 11-sn ("Fulfillment of Norms and Quotas for Average Reduction in Consumption Norms of Fuel, Thermal Energy and Electrical

Energy"). The actual and standardized levels of product energy resource-intensiveness are given in that form.

The standardized indicators reflect the maximum permissible threshold of specific consumption of fuel-energy resources with the technical and organizational conditions for their use which are attained. They are the most important and, at the present time, the only means of control and stimulation of fuel-energy resource consumption efficiency. Standardized levels of specific expenditure of certain types of fuel-energy resources for the production of their other types also have been established.

An analysis of norm fulfillment and a determination of economy (-) or excessive consumption (+) of fuel-energy resources are performed based on generally accepted formulas:  $\Sigma m_n q_1 / \Sigma m_1 q_1$ ,  $\Sigma m_1 q_1 - \Sigma m_n q_1$ , where  $m_1, m_n$  are the actual and standardized specific consumptions of fuel-energy resources respectively in standard units of measurement; and  $q_1$  is the physical output of products in real measurement..

By dividing  $\Sigma m_n q_1$  by the corresponding volume of gross or net product we can obtain the generalizing standardized real-value indicators of product energy resource-intensiveness. By comparing them with the actual level of the real-value indicators of product energy resource-intensiveness we can determine the economy or excessive consumption of fuel-energy resources in relative and absolute terms per unit of produced volume of all gross or net product.

We will show the methodology for computing the most important of those indicators of fuel-energy resource use efficiency using as an example the hypothetical data in the table on the next page.

As shown by results of this table of calculations for the union republic, a national economic saving of outlays in the national fuel-energy complex amounting to R16.1 million (2,538.0+13,560.0) was obtained because of the more efficient consumption of all types of resources. This includes the 84.2 percent share of the economy of capital outlays in the national fuel-energy complex which would have to be allocated to increase production of the saved amount of fuel-energy resources. Such a large relative share of capital outlays in the economy of all social outlays is explained by the fact that, according to calculations, the increase of each ton of standard fuel required 5.3 times more capital outlays than current outlays (226.0:43.3). This shows once more how capital-intensive the fuel-energy complex sectors are.

If we consider the obtained economy of outlays only from the standpoint of the final fuel-energy resource consumers, it was  $-60.0 \cdot 47.0 = -2,820,000$  rubles as a result of their more efficient use, where R47.0 (524,125.0:11,155.0) is the average cost of one standard fuel ton of all consumed types. The difference between this saving and that of current outlays in the national fuel-energy complex of R282,000 (2,820-2,538) is explained by the presence in consumer prices of profit, surplus product produced in fuel-energy complex sectors, and all transport-procurement expenditures for the transfer of fuel-energy resources. It is also advisable to take account of this difference in the overall national economic saving of outlays involving use of fuel-energy

Table - Initial Hypothetical Data and Calculated Indicators of Fuel-Energy Resource Use Efficiency for the Union Republic

Indicators	1980
1. Volume of fuel-energy resources received and expended for production needs broken down* by regions-suppliers and from own production on the republic territory, thousands of tut [standard fuel tons].....	11,155.0
Including:	
1.1. Fuel--total (broken down by types), thousands of tut.....	7,576.0
1.2. Electrical energy, thousands of tut.....	931.1
1.3. Thermal energy, thousands of tut.....	2,647.9
2. Average specific current outlays for the production and transport (transfer) of the above volume of all received fuel-energy resources,** rubles per tut..	42.3
3. Average specific capital-intensiveness per unit increase in produced fuel-energy resources in fuel sectors and electrical power engineering (with lag in I-th year), rubles per tut.....	226.0
4. Value of fuel-energy resources received in production based on average free in warehouse-enterprise consumer prices, thousands of rubles.....	524,125.0
5. Standardized consumption of all fuel-energy resources for product volume actually produced, thousands of tut.....	11,215.0
Including:	
5.1. Fuel, thousands of tut.....	7,614.8
5.2. Electrical energy, thousands of tut.....	937.3
5.3. Thermal energy, thousands of tut.....	2,662.9
6. Produced volume of aggregate social product in nonenergy sectors, millions of rubles.....	12,000.0
7. Generalizing indicator corresponding to global criterion of fuel-energy resource use efficiency (1x2:6), rubles/rubles.....	0.039
8. Generalizing value indicator of product energy resource-intensiveness (4:6), rubles/rubles.....	0.044
9. Real-value indicator of overall product energy resource-intensiveness (1:6), tut/thousands of rubles.....	0.930
10. Standardized level of product energy resource-intensiveness (5:6), tut/thousands of rubles.....	0.935
11. Economy of all types of fuel-energy resources (1-5), thousands of tut.....	-60.0
11.1. Fuel economy (1.1-5.1), thousands of tut.....	-38.8
11.2. Electrical energy economy (1.2-5.2), millions of kilowatt-hours.....	-6.2
11.3. Thermal energy economy (1.3-5.3), thousands of tut.....	-15.0
12. Standard economy of current outlays in the fuel-energy complex (2x11), thousands of rubles.....	-2,538.0
13. Standard economy of capital outlays in the fuel-energy complex (3x11), thousands of rubles.....	-13,560.0

\*In view of the limited size of the article, such a breakdown is not detailed here or further on.

\*\*Outlays for their final consumption were not considered because of difficulties in their determination and the insignificant relative share in overall outlays for use of fuel-energy resources.

resources, which in the final account thus would be  $16.1+0.282=R16,382,000$ . But here we must take account of deviations of the actual average production cost per unit of individual types of fuel-energy resources from that considered in structuring prices on this product for a certain period. Therefore the resulting economy of social outlays can be considered rightful only when the actual production cost per unit of individual types of fuel-energy resources coincides with that considered in approving prices on them. The generalizing indicator of product energy resource-intensiveness in the fuel-energy resource final consumption stage exceeded by 12.8 percent the generalizing indicator corresponding to the criterion of fuel-energy resource use efficiency in the national fuel-energy complex (which considers the direct actual outlays for the use of fuel-energy resources in their production stages).

The economy of fuel consumed in industrial processes for direct energy needs, and as raw materials and basic supplies, has the greatest relative share (64 percent) in the fuel-energy resource economy obtained. The proportion of electrical and thermal energy accounts for the remaining portion (36 percent) of fuel-energy resource economy. These types also determined, in approximately the very same proportions, the overall economy of social outlays involving the use of fuel-energy resources in the country's national economy.

This article gives calculations of basic fuel-energy resource use efficiency indicators without detailing the data base. The article also does not touch on problems of studying the dynamics of those indicators. In our view, however, the set of basic fuel-energy resource use efficiency indicators which is presented can serve as a subject of their further statistical study.

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GENERAL

POWER MINISTER MAYORETS ON TYUMEN POWER SUPPLY PROBLEMS

PM101328 Moscow EKONOMICHESKAYA GAZETA in Russian No 40, October 1985 (Signed to Press 1 Oct 85) p 9

[Article by A.I. Mayorets, USSR minister of power and electrification: "Reliable Power Supplies for the Oil and Gas Complex"--first two paragraphs are weekly's introduction]

[Text] At the 6 September conference of the Tyumen and Tomsk Oblast party-economic activists it was noted that the power industry is seriously inhibiting the development of the oil and gas complex. Unreliable electricity supplies are resulting in big losses of oil and gas and are prompting valid complaints from working people.

At the editorial office's request USSR Minister of Power and Electrification A.I. Mayorets described the measures that are being taken.

On 19 September the USSR Ministry of Power and Electrification collegium examined questions connected with the fulfillment of the Party Central Committee and government decisions on the development of the power industry in West Siberia. Electricity consumption in Tyumen Oblast in the current 5-year plan is ahead of electricity generation in the region. This discrepancy is made up by the USSR integrated power system.

Unfortunately, in the "Tyumenenergo" electricity supply system some consumers are still getting cut off. This is mainly due to operating faults. You have a large number of substations connected to the same line and many of them have inadequate switchgear. In conjunction with the Ministry of the Petroleum Industry we are embarking on the transfer of oil-extraction facilities to the top category of electricity supply reliability. Additional electricity supply enterprises and electricity supply areas are being set up at new deposits. Targets have been approved and are largely being fulfilled for improving the electricity supply systems at oil and gas industry enterprises and replacing old and unreliable switchgear.

Quick-assembly housing has been allocated and help has been given with equipment in order to organize the operation of remote substations.

In connection with the further development of areas in West Siberia near the Arctic Circles it is necessary to retool electricity supply network organizations

and expand plants manufacturing structures and modular installations. The USSR Ministry of Power and Electrification appreciates that there are not enough electrical installation and maintenance organizations in West Siberia and that they are short of highly productive equipment and machinery. We hope to rectify the situation in the immediate future.

The main cause of the nonfulfillment of our targets for commissioning housing in West Siberia is the inadequate housing construction plant capacities in the region. As well as increasing the production of housing construction parts in West Siberia we are enlisting USSR Ministry of Power and Electrification components in other places to supply housing construction parts and construct housing.

The sector has elaborated a program for the development of the power industry in Tyumen Oblast on the basis of local natural and petroleum byproduct gas. Its targets were reflected in the CPSU Central Committee and USSR Council of Ministers resolution on the integrated development of the West Siberian oil and gas industry.

In particular, the USSR Ministry of Power and Electrification intends to establish a balance between the capacity of the Tyumen power system and electricity consumption by commissioning 2.5 times more new capacities at "Tyumenenergo" power stations than in the 11th 5-Year Plan. The link between the Tyumen and Tomsk power systems and the USSR integrated power system is being strengthened by commissioning the 500-kilovolt Itat-Tomsk-Nizhnevartovsk power transmission lines.

Links within the Tyumen Oblast system will be strengthened by constructing 500-kilowatt power transmission lines. Over 12,000 kilometers of 110-220-kilovolt electricity distribution systems will also be laid in order to ensure reliable electricity supplies for new oil and gas deposits. The plan is to construct three times as much housing, as in the 11th 5-Year Plan.

USSR Ministry of Power and Electrification organizations in the region must carry out 2.2 times as much construction and installation work as in the 11th 5-Year Plan. The plan is to construct six powerful new electricity stations. Five of them are already under construction. They are the Surgutskaya GRES-2, the Nizhnevartovskaya GRES, the Urengoyskaya GRES, the Tobolskaya TETS, and the Tyumenskaya TETS-2. Bearing in mind the future development of West Siberia, the USSR Ministry of Power and Electrification deems it expedient to consider the possibility of creating several more power stations using local low-pressure gas.

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GENERAL

FUEL TRANSPORT, DISTRIBUTION IN KIRGHIZIA DESCRIBED

[Editorial Report] Frunze SOVETTIK KYRGYZSTAN in Kirghiz 13 November 1984 carries on page 2 an 800-word article by L. Yushkova, a senior scientist at the Economics Institute of the KiSSR Academy of Sciences and a candidate of the economic sciences, on fuel resources in Kirghizia and their transportation to sites where they are needed. Of the total fuel amount used in the republic, 27 percent comes from local fuel, and the rest is transported from various regions of the country. The transportation of fuel is important in the republic because the natural reserves of coal and oil are basically located in Southern Kirghizia, while most of the enterprises needing the fuel are in the north. Yushkova examines the distribution of coal from Southern Kirghizia. Nearly 47 percent of the whole exported amount goes to Uzbekistan, 23 percent to Kazakhstan, and more than 7 percent to Tajikistan and Turkmenistan. The inter-republic deliveries make up 22 percent of the overall amount. Among the basic consumers of this coal are the Fergana TETs, the Kuvasay GRES, and the brick and cement plants of the above-mentioned republics. In the industrial zones of Northern Kirghizia, coal is obtained from Kuzbass, Karaganda, the Angara basin, and from the southern portion of the republic. Nearly 1 million tons of Southern Kirghizia coal is transported to Northern Kirghizia along with Karaganda and Kuznets coal. But fuel is not always transported in a rational manner. The Osh and Fergana TETs's and the Kuvasay GRES operate with very scarce fuel oil and natural gas. The KiSSR Gosnab and Kyrgyzuglesnabsbyt [Kirghiz Coal Supply and Sale Administration] are working on a rational and orderly system of fuel distribution. The growing need for fuel in the republic prompting acceleration and expansion in the mines. Yushkova mentions the mines of Sulyukta, Kok-Yangak, Uzgen, Tash-Kumyr, Tuyuk, and Kargash in this context.

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